Air Quality Permitting
Technical Memorandum

November 5, 2002

TIER II Operating Permit and Permit to Construct No. 031-00014

McCAIN FOODS INC.
BURLEY, IDAHO

Project No. T2-020400

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FINAL PERMIT

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ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
ASTM	American Society for Testing and Materials
Btu	British thermal unit
CO	carbon monoxide
Department	Department of Environmental Quality
DEQ	Department of Environmental Quality
EPA	Environmental Protection Agency
IDAPA	A numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pound per hour
MMBtu	million British thermal units
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
O_3	ozone
O&M	Operation and Maintenance
OP	operating permit
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SIC	Standard Industrial Classification
SO_2	sulfur dioxide
SO_x	sulfur oxides
T/yr	tons per year
VOC	volatile organic compound

1. PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01 Sections 200 et seq. and 400 et seq., *Rules for the Control of Air Pollution in Idaho.*

2. PROJECT DESCRIPTION

This project is for the issuance of a Tier II Operating Permit and Permit to Construct for McCain Foods Inc. located at Burley, Idaho. This permit consolidates all of the emissions sources at the facility into a single permit with federally enforceable conditions that will allow the facility to operate as a synthetic minor source.

3. SUMMARY OF EVENTS

January 21, 2002	DEQ received an application for a Tier II operating permit from McCain Food Inc.
February 19, 2002	The application was declared complete.
June 3, 2002	DEQ issued a facility draft permit for facility review.
August 5, 2002	DEQ issued a proposed permit for public comment.
August 17, 2002 – September 16, 2002	Public Comment period conducted. No comments were received.

4. FACILITY DESCRIPTION

General Facility Process Description

Prior to processing, trucks deliver raw potatoes from the grower or storage cellars to the site's receiving area. The potatoes are sorted according to size and are temporarily stored in holding bins. Typically, the larger potatoes are transferred to the Prime Products process lines and the smaller potatoes are sent to the Formed Products process lines.

McCain Foods currently operates two process lines for Prime Products, one in each plant. The two plants were originally two facilities, but McCain bought both and they are now combined into one facility in two adjacent areas. McCain's nomenclature refers to the facilities as plant 1 and plant 2. Initially, the potatoes are washed in self-fluming storage bins to remove excess dirt. The potatoes are then conveyed to the peelers. The peelers are pressure vessels in which the potatoes are briefly subjected to high-pressure steam that loosens the skins from the potatoes. The skins are then removed by a scrubber and are transported off-site for use in cattle feed. The potatoes are rinsed in a washer and conveyed to the pretreaters. The pretreaters are warm-water baths that soften the potatoes. The potatoes continue to the trim tables. At the trim tables, potatoes are manually graded and any foreign materials are removed. Low quality potatoes are transported off-site for use in cattle feed.

After being trimmed, the potatoes pass through cutters, which cut them into the desired sizes and shapes. The product is then conveyed over a series of graders to remove any small pieces. These pieces are subsequently diverted to the Formed Products process lines or to cattle feed. The potato products continue to the blanchers. The blanchers are warm-water baths that precondition the potatoes for subsequent processing. The step that follows blanching is called the sugar drag, which is a conditioning and customer quality stage.

Dryers are used to reduce the moisture content of the potato products prior to frying. The two dryers that are operated in conjunction with the Prime Products lines are Prime 1 Dryer (Burley Plant 1) and Prime 2 Dryer (Burley Plant 2). Both of these units are direct-fired dryers that are fueled by natural gas.

After being dried, the potato products are conveyed to fryers where they are cooked in hot vegetable oil. The two fryers that are used for Prime Products are Prime 1 Fryer (Burley Plant 1) and Prime 2 Fryer (Burley Plant 2). The fryers are heated by steam. Each fryer is equipped with an air washer that is essentially a spray-chamber scrubber. In the air washer, exhaust from the fryer is passed through a chamber and contacted with a water spray that saturates the air stream.
The fried products are conveyed into the freezing tunnel. The frozen products are weighed during packaging. On occasion, frozen product will be "cribbed off" or routed to a temporary storage area due to a process problem or for additional quality assurance checks. This product may be added back to the line at the weighing/packaging step at a later time, once all quality issues have been resolved.

Formed Products, such as tater tots and parfries, are manufactured in Burley Plant 1. The Formed Products process is very similar to Prime Products. Smaller potatoes are washed, peeled, and cut. After the potatoes have been cut, they are routed to either the Tot Line or to the Parfry Line.

Potato products in the Tot Line are blanched and conveyed to the Tot Dryer. This unit is a direct, natural gas-fired dryer that removes moisture from the potatoes.

After being dried, the potato products are cut into small slivers and formed into tots. The tots are conveyed to the Tot Fryer in which they are cooked in hot vegetable oil. The fryer is equipped with an air washer that removes PM from the exhaust stream.

The cooked tots are frozen, weighed, and packaged. As in the case of Prime Products, tots may be cribbed off and added back to the line at the weighing/packaging step at a later time.

Potato products in the Parfry Line are blanched and conveyed to the retrograder. The retrograder is not considered an emissions unit because it is a chilling process that is not associated with any combustion sources and does not have external ventilation. The ammonia refrigeration unit associated with the retrograder is a closed-loop system.

After being chilled, to set the starches and allow for easier forming, the potato material is cut into small slivers and formed into parfry patties. The parfry patties are cooked in the Parfry Fryer. The fryer is heated by steam. The cooked parfry patties are frozen, weighed, and packaged. As is the case with Prime Products and tots, parfries may be cribbed off and added back to the line at the weighing/packaging step at a later time.

Four natural gas-fired boilers are used to generate steam for the manufacturing operations at McCain Foods. Two of the units, the Murray 1 Boiler and the Nebraska 1 Boiler, are located in Burley Plant 1. The Murray 1 Boiler has a maximum heat input capacity of 100 MMBtu/hr. The Nebraska 1 Boiler has a maximum heat input capacity of 95.58 MMBtu/hr. The remaining two boilers, the Nebraska 2 Boiler and the Murray 2 Boiler, are located in Burley Plant 2. The Nebraska 2 Boiler has a maximum heat input capacity of 78.05 MMBtu/hr. The Murray 2 Boiler has a maximum heat input capacity of 39.1 MMBtu/hr.

Several of the potato products at McCain Foods are battered. The batter is prepared from various dry ingredients, such as flour and seasonings, in a designated room that is located in Burley Plant 2. Particulate matter is filtered from the air in the batter room by a dust collection system. The system is a package baghouse unit and consists of a group of filter elements that are mounted in an airbox.
A diesel fire pump is used at McCain Foods to create water pressure for emergency fire-fighting efforts. The 170 horsepower pump is connected to the Snake River and is located in a small building north of Burley Plant 1. In addition to emergency situations, the emergency fire pump is operated once a week, for approximately two hours, to insure that the unit is functioning properly.

The emissions sources of the facility are:

- (B101) Murray 1 Boiler, Model: MCF4-78, 100 MMBtu/hr
- (B102) Nebraska 1 Boiler, Model: NS-E-68, 95.58 MMBtu/hr
- (B202) Nebraska 2 Boiler, Model: NS-E-57, 78.05 MMBtu/hr
- (B203) Murray 2 Boiler, Model: MCF2-38, 39.1 MMBtu/hr
- (D105 and D106) Prime 1 Dryer, National Model: 59473, 14 MMBtu/hr
- (D107) Tot Dryer, Rey Industries, 4 MMBtu/hr, Direct-Fired Dryer
- (D205–D208) Prime 2 Dryer, National, 48 MMBtu/hr, Direct-Fired Dryer
- (F103) Tot Fryer, Shockey Model: Ore-Ida
- (F104) Prime 1 Fryer, Shockey Model: Ore-Ida
- (F108) Parfry Fryer, Idaho Steel Products Model: Ore-Ida
- (F204) Prime 2 Fryer, Heat and Control
- (E209) Batter Room Collector
- (E001) Emergency Fire Pump, Detroit Diesel Model: 6061-A2

Facility Classification

The facility is a designated facility as defined in IDAPA 58.01.01.006.27 (total maximum rated heat inputs of the boilers at the facility exceeds 250 MMBtu/hr.). The AIRS Facility Subsystem classification is SM because potential emissions of any criteria pollutant are limited to less than 100 tons per year by production limitations. The facility is not subject to PSD permitting requirements for a major modification because the designated facility's PTE is less than 100 T/yr for any criteria pollutant. This facility is a frozen food processor of potato products, SIC code 2037.

Area Classification

McCain Foods Inc., Cassia County, Idaho, is located in AQCR 64. The area is classified as unclassifiable for all federal and state criteria air pollutants (i.e., PM_{10}, SO_x, O_3, NO_2, CO, and Pb). (There are no class I areas within 10 km of the facility.)

5. TECHNICAL ANALYSIS

Emissions Estimates

McCain foods provided emissions for the facility using emissions estimated from stack testing and AP-42 values. The emissions in Table 1 are expected if the facility operates at maximum capacity (i.e., at the PTE). Emissions calculations are provided in Appendix A.

Table 4.1. POTENTIAL FACILITY EMISSIONS

Pollutants	Emission Rate	
	lb/hr	T/yr
VOCs (as Total Hydrocarbons)	8.98	24.75
Carbon Monoxide (CO)	51.03	88.22
Nitrogen Oxides (NO_x)	45.83	72.49
Particulate Matter (PM_{10})	27.44	84.49
Sulfur Dioxide (SO_2)	0.57	0.42

Modeling

McCain Foods submitted a facility-wide application to limit potential emissions below major source thresholds at their Burley, Idaho facility. Facility-wide modeling was submitted with the application to demonstrate that emissions from the facility would not cause or significantly contribute to a violation of an ambient air quality standard, as required by IDAPA 58.01.01.403.02.

DEQ has reviewed the analyses and supporting materials submitted, and has verified that operation of the McCain Foods facility as specified in the application will satisfy the requirements of IDAPA 58.01.01.403.02. Review of ambient air impacts of Toxic Air Pollutant emissions indicated that emissions would not unreasonably impact human health, as required by IDAPA 58.01.01.161 and DEQ policy. The Modeling review of McCain Foods Inc. permit application can be found in the Appendix B.

Regulatory Review

1. Scope

This project is for the issuance of a Tier II Operating Permit and Permit to Construct for McCain Foods Inc. located at Burley, Idaho. This permit incorporates all of the emissions sources at the facility into a single permit with federally enforceable conditions that will allow the facility to operate as a synthetic minor source.

2. Facility-wide Conditions

The facility-wide conditions are summarized in the Table 2.

Table 5.1. SUMMARY OF FACILITY-WIDE CONDITIONS

Parameter	Permit Limit / Standard Summary	Applicable Requirements Reference
Fugitive emissions	Reasonable precautions	IDAPA 58.01.01.650-651
Odorous gas, liquids, or solids	No emissions that cause air pollution	IDAPA 58.01.01.775-776
Opacity	20%	IDAPA 58.01.01.625
Excess emissions	In compliance with IDAPA 58.01.01.130-136	IDAPA 58.01.01.130
Open burning	In accordance with IDAPA 58.01.01.600-616	IDAPA 58.01.01.600-616
PM_{10}, PM, NO_x, SO_2, CO, VOC, Opacity	Test methods	IDAPA 58.01.01.157
Fuel-burning equipment PM Standard	Grain loading	IDAPA 58.01.01.676-677
Fuel oil sulfur content	ASTM grade 1 - 0.3 % ASTM grade 2 - 0.5 %	IDAPA 58.01.01.728
Air Stagnation Advisory Days	Comply with Air Pollution Emergency Rules in IDAPA 58.01.01.550-562	IDAPA 58.01.01.550-562

3. Boilers

Emissions Limit – (Permit Condition 3.3)

Emissions are limited in Permit Condition 3.3 to the levels listed in Table A1 in the permit to make the facility a synthetic minor. The boilers are limited to total emissions from the combination of all boilers in use at any time. This allows McCain Foods to operate the boilers in the configuration most practical for whatever product is being produced at that time. The emissions estimate for the facility was determined from a compilation of AP-42 emissions factors and source testing. The emissions calculations can be found in Appendix A.

Compliance Demonstration

Fuel Usage Limits

The collective natural gas consumption by the boilers shall not exceed 1,100 MMscf/yr for any consecutive 12-month period.

Fuel Meter

Within 90 days of the issuance of the permit, the permittee shall install, calibrate, maintain, and operate a natural gas flow meter to monitor the monthly and annual natural gas usage of the boilers.

Fuel Type

All the boilers shall be fueled on natural gas exclusively. The maximum total rated heat input capacity is 313 MMBtu per hour.

Monitor Operating Parameters

The permittee shall record the following parameters in a log to demonstrate compliance with the natural gas usage requirements for the boilers at the facility:

- Calendar date and total amount of natural gas burned, in standard cubic feet per month or therms per month, by the four boilers, collectively.
- Calendar date and amount of natural gas burned, in standard cubic feet per year or therms per year for any consecutive 12-month period, by the four boilers, collectively.

NSPS Applicability

The requirements of 40 CFR 60, Subpart D is not applicable for these boilers because all the boilers were installed prior to June 9, 1989.

4. Dryers

Emissions Limit – (Permit Condition 4.3)

Emissions are limited in Permit Condition 4.3 to the levels listed in Table A1 in the permit to make the facility a synthetic minor. The emissions estimate for the facility was determined from a compilation of AP-42 emissions factors and source testing. The emissions calculations can be found in Appendix A.

Compliance Demonstration

Throughput Limits

The maximum throughput of the Prime 1 Dryer shall not exceed 642 tons/day of finished potato product. The maximum annual throughput of the Prime 1 Dryer shall not exceed 173,340 tons of finished potato product per any consecutive 12-month period.

The maximum throughput of the Prime 2 Dryer shall not exceed 540 tons/day of finished potato product. The maximum annual throughput of the Prime 2 Dryer shall not exceed 145,800 tons of finished potato product per any consecutive 12-month period.

The maximum throughput of the Tot Dryer shall not exceed 192 tons/day of finished potato product. The maximum annual throughput of the Tot Dryer shall not exceed 51,840 tons of finished potato product per any consecutive 12-month period.

Fuel Usage Limits

The maximum combustion of natural gas in the Tot Dryer shall not exceed 30 MMscf/yr for any consecutive 12-month period.

The maximum combustion of natural gas in the Prime 1 Dryer shall not exceed 75 MMscf/yr for any consecutive 12-month period.

The maximum combustion of natural gas in the Prime 2 Dryer shall not exceed 120 MMscf/yr for any consecutive 12-month period.

Fuel Meter

Within 90 days of the issuance of the permit, the permittee shall install, calibrate, maintain, and operate a natural gas flow meter to monitor the monthly and annual natural gas usage for the Prime 1 Dryer, Prime 2 Dryer, and Tot Dryer.

Fuel Type

The dryers shall be fueled on natural gas exclusively.

Throughput Monitoring

Each month, the permittee shall monitor and record the throughput of Prime 1 Dryer, Prime 2 Dryer, and Tot Dryer for that month and for the most recent 12-month period. The throughput shall be measured at the packaging step of each process line and shall take into account product that has been manufactured during a 24-hour period.

Monitor Operating Parameters

The permittee shall record the following parameters in a log to demonstrate compliance with the natural gas usage requirements for the Prime 1 Dryer, Prime 2 Dryer, and Tot Dryer at the facility:

- Calendar date and total amount of natural gas burned, in standard cubic feet per month or therms per month, by the Prime 1 Dryer, Prime 2 Dryer, and Tot Dryer.

- Calendar date and amount of natural gas burned, in standard cubic feet per year or therms per yr for any consecutive 12-month period, by the Prime 1 Dryer, Prime 2 Dryer, and Tot Dryer.

5. Fryers

Emissions Limit – (Permit Condition 5.3)

Emissions are limited in Permit Condition 5.3 to the levels listed in Table A1 in the permit to make the facility a synthetic minor. The emissions estimate for the facility was determined from a compilation of AP-42 emissions factors and source testing. The emissions calculations can be found in Appendix A.

Compliance Demonstration

Throughput Limits

The maximum throughput of finished potato product for the Prime 1 Fryer shall not exceed 642 tons/day based on a 24-hour average or 173,340 T/yr for any consecutive 12-month period.

The maximum throughput of finished potato product for the Prime 2 Fryer shall not exceed 540 tons/day based on a 24-hour average or 145,800 T/yr for any consecutive 12-month period.

The maximum throughput of finished potato product for the Tot Fryer shall not exceed 192 tons/day based on a 24-hour average or 51,840 T/yr for any consecutive 12-month period.

The maximum throughput of finished potato product for the Parfry Fryer shall not exceed 61.2 tons/day based on a 24-hour average, or 16,524 T/yr for any consecutive 12-month period.

Air Pollution Control Equipment

The fan and the spray-water pump associated with each air washer shall be operated per the instructions provided in the O&M manual. The pressure at the header of the air washer shall also be set per the specifications identified in the O&M manual by adjusting the pump discharge valve.

The air washer system shall be maintained on a routine basis in accordance with the schedule recommended in the O&M manual. Maintenance activities shall include, but not be limited to, the following:

- Cleaning and replacing the spray-water nozzles,
- Maintaining the pressure pump, and
- Cleaning the eliminator blades.

Throughput Monitoring

Each month, the permittee shall monitor and record the throughput of Prime 1 Fryer, Prime 2 Fryer, Tot Fryer, and Parfry Fryer for that month and for the most recent 12-month period. The throughput shall be measured at the packaging step of each process line and shall take into account product that has been manufactured during a 24-hour period.

Air Pollution Control Parameters

The permittee shall monitor and record the parameters listed below to demonstrate compliance with air pollution control equipment requirements for Prime 1 Fryer Air Washer, Prime 2 Fryer Air Washer, Tot Fryer Air Washer, and Parfry Fryer Air Washer.

- Air washer fan is operable. Verify once daily and record status in log.
- Spray-water pump is operable. Verify once daily and record status in log.
- Spray-water pump pressure. Measure once daily and record pressure in log.
- Maintenance activities. Record date and description in log.

Operations and Maintenance Manual

Within 180 days of issuance of this permit, the permittee shall have developed an O&M manual for the fryer air washers (air pollution control devices). The O&M manual shall describe the procedures that will be followed to insure proper operation of the fryer air washers. The manual shall remain onsite at all times.

6. Batter Room

Emissions Limit – (Permit Condition 6.3)

Emissions are limited in Permit Condition 6.3 to the levels listed in Table A1 in the permit to make the facility a synthetic minor. The emissions estimate for the facility was determined from a compilation of AP-42 emissions factors and source testing. The emissions calculations can be found in Appendix A.

Compliance Demonstration

Baghouse Pressure Drop

The pressure drop across the baghouse shall be maintained within manufacturer's specifications. Documentation of the operating pressure drop specifications for the baghouse shall remain onsite at all times.

Baghouse Operation Monitoring

The permittee shall inspect the Batter Room Dust Collector filters once per month, for tears and holes. The filters shall be replaced as needed. The filter status shall be recorded in a log.

7. Emergency Fire Pump

Emissions Limit – (Permit Condition 7.3)

Emissions are limited in Permit Condition 7.3 to the levels listed in Table A1 in the permit to make the facility a synthetic minor. The emissions estimate for the facility was determined from a compilation of AP-42 emissions factors and source testing. The emissions calculations can be found in Appendix A. The emergency fire pump is not subject the grainloading standards set forth in IDAPA 58.01.01.676-677, this standard is for fuel burning equipment and not internal combustion engines.

Compliance Demonstration

Hours of Operation

The maximum hours of operation for the Emergency Fire Pump shall not exceed two hours per week, except during an emergency. The total number of hours of operation for the Emergency Fire Pump shall not exceed 104 hours for any consecutive 12-month period.

Fuel Specification

The Emergency Fire Pump shall be fired exclusively by No. 2 diesel fuel. The sulfur content of the No. 2 diesel fuel shall be less than 0.5% by weight.

Operation Monitoring

The permittee shall monitor and record the date and the number of hours of operation of the Emergency Fire Pump to verify compliance with the operating parameters previously stated.

8. Emissions Inventory

Table 5.2 ALLOWABLE EMISSIONS

McCain Foods, Burley Emission Estimates[a] – Hourly (lb/hr) and Annual[b] (T/yr)										
Source Description	Hourly PM_{10}[c] Emissions (lb/hr)	Annual PM_{10}[c] Emissions (T/yr)	NO_x		CO		VOC		SO_2	
			lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
(B101) Murray 1 Boiler	0.75	4.18	9.80	55.00	8.24	46.20	0.54	3.03	0.06	0.33
(B102) Nebraska 1 Boiler	0.71		9.37		7.87		0.52		0.02	
(B202) Nebraska 2 Boiler	0.58		7.65		6.43		0.42		0.06	
(B203) Murray 2 Boiler	0.29		3.83		3.22		0.26		0.05	
(D105 and D106) Prime 1 Dryer	6.69	21.67	2.10	5.74	5.12	13.99	0.08	0.21	0.01	0.02
(D107) Tot Dryer	2.00	6.48	0.60	2.30	1.46	5.60	0.02	0.08	0.002	0.01
(D205–D208) Prime 2 Dryer	5.63	18.23	7.20	9.18	17.55	22.38	0.26	0.33	0.03	0.04
(F103) Tot Fryer	4.08	13.22	--	--	--	--	1.20	3.89	--	--
(F104) Prime 1 Fryer	2.68	8.67	--	--	--	--	2.68	8.67	--	--
(F108) Parfry	1.30	4.21	--	--	--	--	0.38	1.24	--	--
(F204) Prime 2 Fryer	2.25	7.29	--	--	--	--	2.25	7.29	--	--
(E209) Batter Room Collector	0.12	0.53	--	--	--	--	--	--	--	--
(E001) Emergency Fire Pump	0.37	0.02	5.27	0.27	1.14	0.06	0.43	0.02	0.35	0.02

[a] As determined by a pollutant-specific U.S. EPA reference method, a Department-approved alternative, or as determined by the Department's emissions estimation methods used in this permit analysis.
[b] As determined by multiplying the actual or allowable (if actual is not available) pound per hour emission rate by the allowable hours per year that the process(es) may operate(s), or by actual annual production rates.
[c] Includes condensables.

9. Airs

AIRS/AFS[a] FACILITY-WIDE CLASSIFICATION[B] DATA ENTRY FORM

AIR PROGRAM / POLLUTANT	SIP [c]	PSD [d]	NSPS [e] (Part 60)	NESHAP [f] (Part 61)	MACT [g] (Part 63)	TITLE V	AREA CLASSIFICATION A – Attainment U – Unclassifiable N – Nonattainment
SO_2 [h]	B						U
NO_x [i]	SM					SM	U
CO [j]	SM					SM	U
PM_{10} [k]	SM					SM	U
PT (Particulate) [l]	SM					SM	U
VOC [m]	B						U
THAP (Total HAPs) [n]	B						U
			APPLICABLE SUBPART				

[a] Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

[b] AIRS/AFS Classification Codes:
- A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For NESHAP only, class "A" is applied to each pollutant which is below the 10 T/yr threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.
- SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
- B = Actual and potential emissions below all applicable major source thresholds.
- C = Class is unknown.
- ND = Major source thresholds are not defined (e.g., radionuclides).

[c] State Implementation Plan
[d] Prevention of Significant Deterioration
[e] New Source Performance Standards
[f] National Emission Standards for Hazardous Air Pollutants
[g] Maximum Achievable Control Technology
[h] Sulfur Dioxide
[i] Nitrogen Oxides
[j] Carbon Monoxide
[k] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
[l] Particulate Matter
[m] Volatile Organic Compounds
[n] Hazardous Air Pollutants

6. FEES

The facility is current with Tier I registration fees in accordance with IDAPA 58.01.01.387. The facility is not required to pay the Tier II processing fee per IDAPA 58.01.01.407.02.d.

7. RECOMMENDATIONS

Based on the review of the application materials, and all applicable state and federal regulations, staff recommends that DEQ issue a Tier II Operating Permit and Permit to Construct to McCain Foods Inc. An opportunity for public comment on the air quality aspects of the proposed permit has been provided in accordance with IDAPA 58.01.01.404.01.c.

APPENDIX A

Emission Calculations

Air Pollutant Emissions
Burley Plant 1 - Tot Dryer (D107)

Combustion Source Characteristics	
Manufacturer	Rey Industries
Model	None
Input Heat Capacity (BTU/hr)	4,000,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,020
Max Hourly Fuel Consumption (scf/hr)	3,922
Annual Fuel Consumption (scf/yr)[a]	30,000,000

Process Characteristics	
Max Hourly Production Rate (lb/hr)	16,000
Annual Production Rate (TPY)[b]	51,840

Stack Data[c]	
Proposed Stack Height (ft)	52.5
Stack Diameter (ft)	2.99
Exit Gas Temperature (°F)	118.1
Exit Gas Moisture Content	4.62%
Wet Actual Flow Rate (acfm)	19,173
Wet Standard Flow Rate (wscfm)	15,297
Dry Standard Flow Rate (dscfm)	14,590
Stack Gas Velocity (m/s)	13.92
Stack Gas Pressure (mm Hg)	663.96

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[d]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)	Significant Level[e] (TPY)	Below Regulatory Concern?[f]	Significant Contribution?[e]
PM_{10}	NG Combustion & Process	See PM	See PM	2.000	6.480	0.252	15	no	no
SO_2	NG Combustion	0.6	lb/10^6 scf	0.002	0.009	2.96E-04	40	yes	no
NO_x	NG Combustion & Process	153	lb/10^6 scf	0.600	2.295	0.076	40	yes	no
CO	NG Combustion & Process	373	lb/10^6 scf	1.463	5.595	0.184	100	yes	no
VOC	NG Combustion	5.5	lb/10^6 scf	0.022	0.083	0.003	40	yes	no
Lead	NG Combustion	0.0005	lb/10^6 scf	1.96E-06	7.50E-06	2.47E-07	0.6	yes	no

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[d]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)	Significant Level[e] (TPY)	Below Regulatory Concern?[f]	Significant Contribution?[e]
PM	NG Combustion & Process	0.25	lb/finished ton	2.000	6.480	0.252	25	no	no
Beryllium	NG Combustion	<1.2E-5	lb/10^6 scf	4.71E-08	1.80E-07	5.93E-09	0.0004	yes	no
Mercury	NG Combustion	2.60E-04	lb/10^6 scf	1.02E-06	3.90E-06	1.28E-07	0.1	yes	no

Other Pollutants

Pollutant	Pollutant Source	Emission Factor[d]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
TOC	NG Combustion	11	lb/10^6 scf	0.043	0.165	0.005
Methane	NG Combustion	2.3	lb/10^6 scf	0.009	0.035	0.001
CO_2	NG Combustion	120,000	lb/10^6 scf	471	1800	59.3
N_2O	NG Combustion	2.2	lb/10^6 scf	0.009	0.033	0.001

Process Weight Rule[g]

Pollutant	Pollutant Source	Potential Emissions (lb/hr)	Potential Emissions (gr/dscf)	Allowable Emissions (gr/dscf)	Meets Standard?
PM	Process	2.000	0.016	0.2	yes

PM Grain Loading Standard - Not Applicable[h]

Notes:

(a) The annual natural gas consumption for this emission unit will be limited.

(b) The annual production rate associated with this emission unit will be limited. Estimate is equivalent to operating 300 days per year at 90% of maximum hourly production rate.

(c) Stack gas flow data obtained from testing conducted in November 2001.

(d) Emission factors for NO_x and CO generated by the process and natural gas combustion based on April 1994 Ore-Ida Source Test (Ontario, OR - Prime 1 North Dryer). Emission factors for PM generated by the process and natural gas combustion based on October 1994 Ore-Ida Source Test (Burley, ID - Prime 1 Dryer), April 1995 Ore-Ida Source Test (Ontario, OR - P1 Dryer) and February 1997 Ore-Ida Source test (Ontario, OR - P2 & P3 Dryers). As a conservative approach, emissions that were measured as PM during the source tests were considered to equal PM_{10}. Emission factors for other pollutants from AP-42 Chapter 1.4, "Natural Gas Combustion".

(e) IDAPA 58.01.01.006.92

(f) IDAPA 58.01.01.221.01

(g) IDAPA 58.01.01.710.08. Process weight rule standard is 0.2 gr/dscf for units constructed or modified prior to July 1, 2000.

Toxic Air Pollutant Emissions
Burley Plant 1 - Tot Dryer (D107)

Combustion Source Characteristics

mer Manufacturer	Rey Industries
del	None
ut Heat Capacity (BTU/hr)	4,000,000
el	Natural Gas
ating Value (BTU/scf)	1,020
x Hourly Fuel Consumption (scf/hr)	3,922
nual Fuel Consumption (scf/yr)[a]	30,000,000

Process Characteristics

x Hourly Production Rate (lb/hr)	16,000
nual Production Rate (TPY)[b]	51,840

Stack Data[c]

Proposed Stack Height (ft)	52.5
Stack Diameter (ft)	2.99
Exit Gas Temperature (°F)	118.1
Exit Gas Moisture Content	4.62%
Wet Actual Flow Rate (acfm)	19,173
Wet Standard Flow Rate (wscfm)	15,297
Dry Standard Flow Rate (dscfm)	14,590
Stack Velocity (m/s)	13.92
Stack Gas Pressure (mm Hg)	663.96

xic Air Pollutants

Pollutant	Emission Factor[d]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)	Emission Limit[e] (lb/hr)	Modeling Required?[f]
Arsenic	2.00E-04	lb/10^6 scf	7.84E-07	3.00E-06	9.88E-08	1.50E-06	no
Barium	4.40E-03	lb/10^6 scf	1.73E-05	6.60E-05	2.17E-06	3.30E-02	no
Benzene	2.10E-03	lb/10^6 scf	8.24E-06	3.15E-05	1.04E-06	8.00E-04	no
Beryllium	<1.2E-5	lb/10^6 scf	4.71E-08	1.80E-07	5.93E-09	2.80E-05	no
Benzo(a)pyrene	<1.2E-6	lb/10^6 scf	4.71E-09	1.80E-08	5.93E-10	2.00E-06	no
Bis (2-ethylhexyl)phthalate	FNA	lb/10^6 scf	FNA	FNA	FNA	2.80E-02	no
Cadmium	1.10E-03	lb/10^6 scf	4.31E-06	1.65E-05	5.44E-07	3.70E-06	yes
Chromium	1.40E-03	lb/10^6 scf	5.49E-06	2.10E-05	6.92E-07	3.30E-02	no
Cobalt	8.40E-05	lb/10^6 scf	3.29E-07	1.26E-06	4.15E-08	3.30E-03	no
Copper	8.50E-04	lb/10^6 scf	3.33E-06	1.28E-05	4.20E-07	3.33E-01	no
Dibutylphthalate	FNA	lb/10^6 scf	FNA	FNA	FNA	6.70E-02	no
Dichlorobenzene	1.20E-03	lb/10^6 scf	4.71E-06	1.80E-05	5.93E-07	2.00E+01	no
Ethylbenzene	FNA	lb/10^6 scf	FNA	FNA	FNA	2.90E+01	no
Fluorene	2.80E-06	lb/10^6 scf	1.10E-08	4.20E-08	1.38E-09	1.33E-01	no
Formaldehyde	7.50E-02	lb/10^6 scf	2.94E-04	1.13E-03	3.71E-05	5.10E-04	no
Hexane	1.80E+00	lb/10^6 scf	7.06E-03	2.70E-02	8.89E-04	1.20E+01	no
Manganese	3.80E-04	lb/10^6 scf	1.49E-06	5.70E-06	1.88E-07	3.33E-01	no
Mercury	2.60E-04	lb/10^6 scf	1.02E-06	3.90E-06	1.28E-07	3.00E-03	no
Molybdenum	1.10E-03	lb/10^6 scf	4.31E-06	1.65E-05	5.44E-07	3.33E-01	no
Napthalene	6.10E-04	lb/10^6 scf	2.39E-06	9.15E-06	3.01E-07	3.33E+00	no
Nickel	2.10E-03	lb/10^6 scf	8.24E-06	3.15E-05	1.04E-06	2.70E-05	no
Pentane	2.60E+00	lb/10^6 scf	1.02E-02	3.90E-02	1.28E-03	1.18E+02	no
Phenol	FNA	lb/10^6 scf	FNA	FNA	FNA	1.27E+00	no
Selenium	<2.4E-5	lb/10^6 scf	9.41E-08	3.60E-07	1.19E-08	1.30E-02	no
Toluene	3.40E-03	lb/10^6 scf	1.33E-05	5.10E-05	1.68E-06	2.50E+01	no
Vanadium	2.30E-03	lb/10^6 scf	9.02E-06	3.45E-05	1.14E-06	3.00E-03	no
o-Xylene	FNA	lb/10^6 scf	FNA	FNA	FNA	2.90E+01	no
Zinc	2.90E-02	lb/10^6 scf	1.14E-04	4.35E-04	1.43E-05	6.67E-01	no

es:
The annual natural gas consumption for this emission unit will be limited.
The annual production rate associated with this emission unit will be limited. Estimate
s equivalent to operating 300 days per year at 90% of maximum hourly production rate.
Stack gas flow data obtained from testing conducted in November 2001.
Emission Factors from AP-42 Chapter 1.4, "Natural Gas Combustion".
DAPA 58.01.01.585 and 586
DAPA 58.01.01.210.05(b)
NA - Factor Not Available

Air Pollutant Emissions
Burley Plant 1 - Prime 1 Dryer (D105 - D106)

Combustion Source Characteristics	
Manufacturer	Nebraska
Model	59473
Input Heat Capacity (BTU/hr)	14,000,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,020
Max Hourly Fuel Consumption (scf/hr)	13,725
Annual Fuel Consumption (scf/yr)[a]	75,000,000

Process Characteristics	
Max Hourly Production Rate (lb/hr)	53,500
Annual Production Rate (TPY)[b]	173,340

Stack Data[c]		
Proposed Stack Height (ft)	60.7	60.7
Stack Diameter (ft)	3.39	3.39
Exit Gas Temperature (°F)	215.8	160.0
Exit Gas Moisture Content	6.68%	5.81%
Wet Actual Flow Rate (acfm)	16,417	14,504
Wet Standard Flow Rate (wscfm)	11,177	10,741
Dry Standard Flow Rate (dscfm)	10,430	10,117
Stack Velocity (m/s)	9.27	8.19
Stack Gas Pressure (mm Hg)	662.18	660.91
	East Stack	***West Stack***

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[d]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)	Significant Level[e] (TPY)	Below Regulatory Concern?[f]	Significant Contribution?[e]
PM_{10}	NG Combustion & Process	See PM	See PM	6.688	21.668	0.843	15	no	yes
SO_2	NG Combustion	0.6	lb/10^6 scf	0.008	0.023	0.001	40	yes	no
NO_x	NG Combustion & Process	153	lb/10^6 scf	2.100	5.738	0.265	40	no	no
CO	NG Combustion & Process	373	lb/10^6 scf	5.120	13.988	0.645	100	no	no
VOC	NG Combustion	5.5	lb/10^6 scf	0.075	0.206	0.010	40	yes	no
Lead	NG Combustion	0.0005	lb/10^6 scf	6.86E-06	1.88E-05	8.65E-07	0.6	yes	no

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[d]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)	Significant Level[e] (TPY)	Below Regulatory Concern?[f]	Significant Contribution?[e]
PM	NG Combustion & Process	0.25	lb/finished ton	6.688	21.668	0.843	25	no	no
Beryllium	NG Combustion	<1.2E-5	lb/10^6 scf	1.65E-07	4.50E-07	2.08E-08	0.0004	yes	no
Mercury	NG Combustion	2.60E-04	lb/10^6 scf	3.57E-06	9.75E-06	4.50E-07	0.1	yes	no

Other Pollutants

Pollutant	Pollutant Source	Emission Factor[d]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
TOC	NG Combustion	11	lb/10^6 scf	0.151	0.413	0.019
Methane	NG Combustion	2.3	lb/10^6 scf	0.032	0.086	0.004
CO_2	NG Combustion	120,000	lb/10^6 scf	1647	4500	207.5
N_2O	NG Combustion	2.2	lb/10^6 scf	0.030	0.083	0.004

Process Weight Rule[g]

Pollutant	Pollutant Source	Potential Emissions (lb/hr)	E. Stack Emissions (gr/dscf)	W. Stack Emissions (gr/dscf)	Allowable Emissions (gr/dscf)	All Stacks Meet Standard?
PM	Process	6.688	0.075	0.077	0.2	yes

PM Grain Loading Standard - Not Applicable[h]

Notes:

(a) The annual natural gas consumption for this emission unit will be limited.

(b) The annual production rate associated with this emission unit will be limited. Estimate is equivalent to operating 300 days per year at 90% of maximum hourly production rate.

(c) This emission unit vents to the atmosphere via two stacks. Stack gas flow data obtained from testing conducted in November 2001.

(d) Emission factors for NO_x and CO generated by the process and natural gas combustion based on April 1994 Ore-Ida Source Test (Ontario, OR - Prime 1 North Dryer). Emission factors for PM generated by the process and natural gas combustion based on October 1994 Ore-Ida Source Test (Burley, ID - Prime 1 Dryer), April 1995 Ore-Ida Source Test (Ontario, OR - P1 Dryer) and February 1997 Ore-Ida Source test (Ontario, OR - P2 & P3 Dryers). As a conservative approach, emissions that were measured as PM during the source tests were considered to equal PM_{10}. Emission factors for other pollutants from AP-42 Chapter 1.4, "Natural Gas Combustion".

(e) IDAPA 58.01.01.006.92

(f) IDAPA 58.01.01.221.01

(g) IDAPA 58.01.01.710.08. Process weight rule standard is 0.2 gr/dscf for units constructed or modified prior to July 1, 2000.

(h) IDAPA 58.01.01.676 or 677 - The Prime 1 Dryer is a direct heat transfer system. Therefore, it does not satisfy the definition of "fuel burning equipment" as presented in IDAPA 58.01.01.006.41.

* NA - Not Applicable

Toxic Air Pollutant Emissions
Burley Plant 1 - Prime 1 Dryer (D105 - D106)

Combustion Source Characteristics

ner	Nebraska
del	59473
ut Heat Capacity (BTU/hr)	14,000,000
el	Natural Gas
ating Value (BTU/scf)	1,020
x Hourly Fuel Consumption (scf/hr)	13,725
nual Fuel Consumption (scf/yr)[a]	75,000,000

Process Characteristics

x Hourly Production Rate (lb/hr)	53,500
nual Production Rate (TPY)[b]	173,340

Stack Data[c]

	East Stack	West Stack
Proposed Stack Height (ft)	60.7	60.7
Stack Diameter (ft)	3.39	3.39
Exit Gas Temperature (°F)	215.8	160.0
Exit Gas Moisture Content	6.66%	5.81%
Wet Actual Flow Rate (acfm)	16,417	14,504
Wet Standard Flow Rate (wscfm)	11,177	10,741
Dry Standard Flow Rate (dscfm)	10,430	10,117
Stack Velocity (m/s)	9.27	8.19
Stack Gas Pressure (mm Hg)	662.18	660.91

xic Air Pollutants

Pollutant	Emission Factor[d]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)	Emission Limit[e] (lb/hr)	Modeling Required?[f]
Arsenic	2.00E-04	lb/10^6 scf	2.75E-06	7.50E-06	3.46E-07	1.50E-06	yes
Barium	4.40E-03	lb/10^6 scf	6.04E-05	1.65E-04	7.61E-06	3.30E-02	no
Benzene	2.10E-03	lb/10^6 scf	2.88E-05	7.88E-05	3.63E-06	8.00E-04	no
Beryllium	<1.2E-5	lb/10^6 scf	1.65E-07	4.50E-07	2.08E-08	2.80E-05	no
Benzo(a)pyrene	<1.2E-6	lb/10^6 scf	1.65E-08	4.50E-08	2.08E-09	2.00E-06	no
Bis (2-ethylhexyl)phthalate	FNA	lb/10^6 scf	FNA	FNA	FNA	2.80E-02	no
Cadmium	1.10E-03	lb/10^6 scf	1.51E-05	4.13E-05	1.90E-06	3.70E-06	yes
Chromium	1.40E-03	lb/10^6 scf	1.92E-05	5.25E-05	2.42E-06	3.30E-02	no
Cobalt	8.40E-05	lb/10^6 scf	1.15E-06	3.15E-06	1.45E-07	3.30E-03	no
Copper	8.50E-04	lb/10^6 scf	1.17E-05	3.19E-05	1.47E-06	3.33E-01	no
Dibutylphthalate	FNA	lb/10^6 scf	FNA	FNA	FNA	6.70E-02	no
Dichlorobenzene	1.20E-03	lb/10^6 scf	1.65E-05	4.50E-05	2.08E-06	2.00E+01	no
Ethylbenzene	FNA	lb/10^6 scf	FNA	FNA	FNA	2.90E+01	no
Fluorene	2.80E-06	lb/10^6 scf	3.84E-08	1.05E-07	4.84E-09	1.33E-01	no
Formaldehyde	7.50E-02	lb/10^6 scf	1.03E-03	2.81E-03	1.30E-04	5.10E-04	yes
Hexane	1.80E+00	lb/10^6 scf	2.47E-02	6.75E-02	3.11E-03	1.20E+01	no
Manganese	3.80E-04	lb/10^6 scf	5.22E-06	1.43E-05	6.57E-07	3.33E-01	no
Mercury	2.60E-04	lb/10^6 scf	3.57E-06	9.75E-06	4.50E-07	3.00E-03	no
Molybdenum	1.10E-03	lb/10^6 scf	1.51E-05	4.13E-05	1.90E-06	3.33E-01	no
Napthalene	6.10E-04	lb/10^6 scf	8.37E-06	2.29E-05	1.05E-06	3.33E+00	no
Nickel	2.10E-03	lb/10^6 scf	2.88E-05	7.88E-05	3.63E-06	2.70E-05	yes
Pentane	2.60E+00	lb/10^6 scf	3.57E-02	9.75E-02	4.50E-03	1.18E+02	no
Phenol	FNA	lb/10^6 scf	FNA	FNA	FNA	1.27E+00	no
Selenium	<2.4E-5	lb/10^6 scf	3.29E-07	9.00E-07	4.15E-08	1.30E-02	no
Toluene	3.40E-03	lb/10^6 scf	4.67E-05	1.28E-04	5.88E-06	2.50E+01	no
Vanadium	2.30E-03	lb/10^6 scf	3.16E-05	8.63E-05	3.98E-06	3.00E-03	no
o-Xylene	FNA	lb/10^6 scf	FNA	FNA	FNA	2.90E+01	no
Zinc	2.90E-02	lb/10^6 scf	3.98E-04	1.09E-03	5.02E-05	6.67E-01	no

es:
The annual natural gas consumption for this emission unit will be limited.
The annual production rate associated with this emission unit will be limited. Estimate
s equivalent to operating 300 days per year at 90% of maximum hourly production rate.
This emission unit vents to the atmosphere via two stacks. Stack gas flow data obtained from testing conducted in November 2001.
Emission Factors from AP-42 Chapter 1.4, "Natural Gas Combustion".
DAPA 58.01.01.585 and 586
DAPA 58.01.01.210.05(b)
FNA - Factor Not Available

Air Pollutant Emissions
Burley Plant 2 - Prime 2 Dryer (D205 - D208)

Combustion Source Characteristics	
Burner Manufacturer	National
Model	None
Input Heat Capacity (BTU/hr)	48,000,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,020
Max Hourly Fuel Consumption (scf/hr)	47,059
Annual Fuel Consumption (scf/yr)[a]	120,000,000

Process Characteristics	
Max Hourly Production Rate (lb/hr)	45,000
Annual Production Rate (TPY)[b]	145,800

Stack Data[c]				
Proposed Stack Height (ft)	39.4	39.4	39.4	39.4
Stack Diameter (ft)	4.76	4.76	4.76	4.76
Exit Gas Temperature (°F)	112.0	105.0	114.6	96.8
Exit Gas Moisture Content	5.51%	6.69%	6.39%	6.78%
Wet Actual Flow Rate (acfm)	40,152	42,877	35,678	40,006
Wet Standard Flow Rate (wscfm)	32,231	34,794	28,511	33,006
Dry Standard Flow Rate (dscfm)	30,455	32,466	26,689	30,768
Stack Velocity (m/s)	11.38	12.16	10.12	11.34
Stack Gas Pressure (mm Hg)	660.91	661.16	660.91	661.16
	Stack #1	*Stack #2*	*Stack #3*	*Stack #4*

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[d]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)	Significant Level[e] (TPY)	Below Regulatory Concern?[f]	Significant Contribution?*
PM_{10}	NG Combustion & Process	See PM	See PM	5.625	18.225	0.709	15	no	yes
SO_2	NG Combustion	0.6	lb/10^6 scf	0.028	0.036	0.004	40	yes	no
NO_x	NG Combustion & Process	153	lb/10^6 scf	7.200	9.180	0.907	40	no	no
CO	NG Combustion & Process	373	lb/10^6 scf	17.553	22.380	2.212	100	no	no
VOC	NG Combustion	5.5	lb/10^6 scf	0.259	0.330	0.033	40	yes	no
Lead	NG Combustion	0.0005	lb/10^6 scf	2.35E-05	3.00E-05	2.96E-06	0.6	yes	no

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[d]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)	Significant Level[e] (TPY)	Below Regulatory Concern?[f]	Significant Contribution?*
PM	NG Combustion & Process	0.25	lb/finished ton	5.625	18.225	0.709	25	no	no
Beryllium	NG Combustion	<1.2E-5	lb/10^6 scf	5.65E-07	7.20E-07	7.12E-08	0.0004	yes	no
Mercury	NG Combustion	2.60E-04	lb/10^6 scf	1.22E-05	1.56E-05	1.54E-06	0.1	yes	no

Other Pollutants

Pollutant	Pollutant Source	Emission Factor[d]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
TOC	NG Combustion	11	lb/10^6 scf	0.516	0.660	0.065
Methane	NG Combustion	2.3	lb/10^6 scf	0.108	0.138	0.014
CO_2	NG Combustion	120,000	lb/10^6 scf	5647	7200	711.5
N_2O	NG Combustion	2.2	lb/10^6 scf	0.104	0.132	0.013

Process Weight Rule[g]

Pollutant	Pollutant Source	Potential Emissions (lb/hr)	Stack #1 Emissions (gr/dscf)	Stack #2 Emissions (gr/dscf)	Stack #3 Emissions (gr/dscf)	Stack #4 Emissions (gr/dscf)	Allowable Emissions (gr/dscf)	All Stacks Meet Standard?
PM	Process	5.625	0.022	0.020	0.025	0.021	0.2	yes

PM Grain Loading Standard - Not Applicable[h]

Notes:

(a) The annual natural gas consumption for this emission unit will be limited.

(b) The annual production rate associated with this emission unit will be limited. Estimate is equivalent to operating 300 days per year at 90% of maximum hourly production rate.

(c) This emission unit vents to the atmosphere via four stacks. Stack gas flow data obtained from testing conducted in November 2001.

(d) Emission factors for NO_x and CO generated by the process and natural gas combustion based on April 1994 Ore-Ida Source Test (Ontario, OR - Prime 1 North Dryer). Emission factors for PM generated by the process and natural gas combustion based on October 1994 Ore-Ida Source Test (Burley, ID - Prime 1 Dryer), April 1995 Ore-Ida Source Test (Ontario, OR - P1 Dryer) and February 1997 Ore-Ida Source test (Ontario, OR - P2 & P3 Dryers). As a conservative approach, emissions that were measured as PM during the source tests were considered to equal PM_{10}. Emission factors for other pollutants from AP-42 Chapter 1.4, "Natural Gas Combustion".

(e) IDAPA 58.01.01.006.92

(f) IDAPA 58.01.01.221.01

(g) IDAPA 58.01.01.710.08. Process weight rule standard is 0.2 gr/dscf for units constructed or modified prior to July 1, 2000.

(h) IDAPA 58.01.01.676 or 677 - The Prime 2 Dryer is a direct heat transfer system. Therefore, it does not satisfy the definition of "fuel burning equipment" as presented in IDAPA 58.01.01.006.41.

* NA - Not Applicable

Toxic Air Pollutant Emissions
Burley Plant 2 - Prime 2 Dryer (D205 - D208)

Combustion Source Characteristics

rner	National
del	None
ut Heat Capacity (BTU/hr)	48,000,000
el	Natural Gas
ating Value (BTU/scf)	1,020
x Hourly Fuel Consumption (scf/hr)	47,059
nual Fuel Consumption (scf/yr)[a]	120,000,000

Process Characteristics

x Hourly Production Rate (lb/hr)	45,000
nual Production Rate (TPY)[b]	145,800

Stack Data[c]

	Stack #1	Stack #2	Stack #3	Stack #4
Proposed Stack Height (ft)	39.4	39.4	39.4	39.4
Stack Diameter (ft)	4.78	4.78	4.78	4.78
Exit Gas Temperature (°F)	112.0	106.0	114.6	96.8
Exit Gas Moisture Content	5.51%	6.69%	6.39%	6.78%
Wet Actual Flow Rate (acfm)	40,152	42,877	35,678	40,006
Wet Standard Flow Rate (wscfm)	32,231	34,794	28,511	33,006
Dry Standard Flow Rate (dscfm)	30,455	32,466	26,689	30,768
Stack Velocity (m/s)	11.38	12.16	10.12	11.34
Stack Gas Pressure (mm Hg)	660.91	661.16	660.91	661.16

xic Air Pollutants

Pollutant	Emission Factor[d]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)	Emission Limit[e] (lb/hr)	Modeling Required?[f]
Arsenic	2.00E-04	lb/10^6 scf	9.41E-06	1.20E-05	1.19E-06	1.50E-06	yes
Barium	4.40E-03	lb/10^6 scf	2.07E-04	2.64E-04	2.61E-05	3.30E-02	no
Benzene	2.10E-03	lb/10^6 scf	9.88E-05	1.26E-04	1.25E-05	8.00E-04	no
Beryllium	<1.2E-5	lb/10^6 scf	5.65E-07	7.20E-07	7.12E-08	2.80E-05	no
Benzo(a)pyrene	<1.2E-6	lb/10^6 scf	5.65E-08	7.20E-08	7.12E-09	2.00E-06	no
Bis (2-ethylhexyl)phthalate	FNA	lb/10^6 scf	FNA	FNA	FNA	2.80E-02	no
Cadmium	1.10E-03	lb/10^6 scf	5.18E-05	6.60E-05	6.52E-06	3.70E-06	yes
Chromium	1.40E-03	lb/10^6 scf	6.59E-05	8.40E-05	8.30E-06	3.30E-02	no
Cobalt	8.40E-05	lb/10^6 scf	3.95E-06	5.04E-06	4.98E-07	3.30E-03	no
Copper	8.50E-04	lb/10^6 scf	4.00E-05	5.10E-05	5.04E-06	3.33E-01	no
Dibutylphthalate	FNA	lb/10^6 scf	FNA	FNA	FNA	6.70E-02	no
Dichlorobenzene	1.20E-03	lb/10^6 scf	5.65E-05	7.20E-05	7.12E-06	2.00E+01	no
Ethylbenzene	FNA	lb/10^6 scf	FNA	FNA	FNA	2.90E+01	no
Fluorene	2.80E-06	lb/10^6 scf	1.32E-07	1.68E-07	1.66E-08	1.33E-01	no
Formaldehyde	7.50E-02	lb/10^6 scf	3.53E-03	4.50E-03	4.45E-04	5.10E-04	yes
Hexane	1.80E+00	lb/10^6 scf	8.47E-02	1.08E-01	1.07E-02	1.20E+01	no
Manganese	3.80E-04	lb/10^6 scf	1.79E-05	2.28E-05	2.25E-06	3.33E-01	no
Mercury	2.60E-04	lb/10^6 scf	1.22E-05	1.56E-05	1.54E-06	3.00E-03	no
Molybdenum	1.10E-03	lb/10^6 scf	5.18E-05	6.60E-05	6.52E-06	3.33E-01	no
Napthalene	6.10E-04	lb/10^6 scf	2.87E-05	3.66E-05	3.62E-06	3.33E+00	no
Nickel	2.10E-03	lb/10^6 scf	9.88E-05	1.26E-04	1.25E-05	2.70E-05	yes
Pentane	2.60E+00	lb/10^6 scf	1.22E-01	1.56E-01	1.54E-02	1.18E+02	no
Phenol	FNA	lb/10^6 scf	FNA	FNA	FNA	1.27E+00	no
Selenium	<2.4E-5	lb/10^6 scf	1.13E-06	1.44E-06	1.42E-07	1.30E-02	no
Toluene	3.40E-03	lb/10^6 scf	1.60E-04	2.04E-04	2.02E-05	2.50E+01	no
Vanadium	2.30E-03	lb/10^6 scf	1.08E-04	1.38E-04	1.36E-05	3.00E-03	no
o-Xylene	FNA	lb/10^6 scf	FNA	FNA	FNA	2.90E+01	no
Zinc	2.90E-02	lb/10^6 scf	1.36E-03	1.74E-03	1.72E-04	6.67E-01	no

es:
The annual natural gas consumption for this emission unit will be limited.
The annual production rate associated with this emission unit will be limited. Estimate
s equivalent to operating 300 days per year at 90% of maximum hourly production rate.
This emission unit vents to the atmosphere via four stacks. Stack gas flow data obtained from testing conducted in November 2001.
Emission Factors from AP-42 Chapter 1.4, "Natural Gas Combustion".
IDAPA 58.01.01.585 and 586
DAPA 58.01.01.210.05(b)
FNA - Factor Not Available

Air Pollutant Emissions
Fryers

Emission Source	Pollutant	Emission Factor[a] (lb/finished ton)	Maximum Production Rate (finished lb/hr)	Emission Rate (lb/hr)	Emission Rate[b] (TPY)	Significant Level[c] (TPY)	Below Regulatory Concern?[d]	Significant?[e]	Allowable PM Emissions (gr/dscf)	Meets Standard?* (gr/dscf)
Parfry Fryer Air Washer (F108)	PM_{10}	0.51	5,100	1.301	4.214	15	no	no	0.026	yes
	VOC	0.15	5,100	0.383	1.239	40	yes	no	NA	NA
Tot Fryer Air Washer (F103)	PM_{10}	0.51	16,000	4.080	13.219	15	no	no	0.043	yes
	VOC	0.15	16,000	1.200	3.888	40	yes	no	NA	NA
Prime 1 Fryer Air Washer (F104)	PM_{10}	0.10	53,500	2.675	8.667	15	no	no	0.053	yes
	VOC	0.10	53,500	2.675	8.667	40	no	no	NA	NA
Prime 2 Fryer Air Washer (F204)	PM_{10}	0.10	45,000	2.250	7.290	15	no	no	0.023	yes
	VOC	0.10	45,000	2.250	7.290	40	no	no	NA	NA

Emission Source[f]	Stack Height (ft)	Stack Diameter (ft)	Exit Gas Temperature (°F)	Exit Gas Moisture	Wet Flow Rate (acfm)	Dry Flow Rate (dscfm)	Stack Gas Velocity (m/s)	Stack Gas Pressure (mm Hg)
Parfry Fryer Air Washer (F108)	52.5	2.61	101.0	5.58%	7,587	5,886	7.20	663.45
Tot Fryer Air Washer (F103)	53.6	3.71	131.0	17.89%	17,268	11,059	8.13	663.45
Prime 1 Fryer Air Washer (F104)	59.0	3.12	175.1	39.40%	13,390	5,887	8.91	663.19
Prime 2 Fryer Air Washer (F204)	44.6	3.17	156.4	26.75%	20,729	11,262	13.38	658.11

Notes:

(a) Emission factors for Parfry Fryer and Tot Fryer based on October 1994 Ore-Ida Source Test (Plover, WI - P2 Specialty 3 Fryer with Air Washer)
Emission factors for Prime 1 Fryer and Prime 2 Fryer based on October 1994 Ore-Ida Source Test (Burley, ID - Prime 1 Fryer with Air Washer) and April 1994 Ore-Ida Source Test (Ontario, OR - Prime 1 French Fryer with Air Washer). As a conservative approach, emissions that were measured as PM during the source tests were considered to equal PM_{10}.

(b) Annual emissions based on limited annual production rate that is equivalent to operating 300 days per year at 90% of maximum hourly production rate.

(c) IDAPA 58.01.01.006.92

(d) IDAPA 58.01.01.221.01

(e) IDAPA 58.01.01.710.08. Process weight rule standard is 0.2 gr/dscf for units constructed or modified prior to July 1, 2000.

(f) Stack gas flow data obtained from testing conducted in November 2001.

* Grain Loading Standard - IDAPA 58.01.01.676 is not applicable because these emission sources are not "fuel burning equipment".

Air Pollutant Emissions
Burley Plant 1 - Murray 1 Boiler (B101)

Combustion Source Characteristics	
Boiler Manufacturer	Murray Boiler
Burner Model	Coen DAZ
Input Heat Capacity (BTU/hr)	100,000,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,020
Max Hourly Fuel Consumption (scf/hr)	98,039
Annual Fuel Consumption (scf/yr)[a]	"Bubbled"

Site Information	
Burley Barometric Pressure (mm Hg)	654.18

Stack Data	
Stack Height (ft)	40.7
Stack Diameter (ft)	5.00
Exit Gas Temperature (°F)	308
Wet Actual Flow Rate (acfm)	29,882
Wet Standard Flow Rate (wscfm)	17,683
Dry Standard Flow Rate (dscfm)	14,517
Grain Loading Flow Rate (dscfm)	19,691
Stack Velocity (m/s)	7.73
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[b]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM_{10}	NG Combustion	7.6	$lb/10^6$ scf	0.745	*	0.094
SO_2	NG Combustion	0.6	$lb/10^6$ scf	0.059	*	0.007
NO_x	NG Combustion	100	$lb/10^6$ scf	9.804	*	1.235
CO	NG Combustion	84	$lb/10^6$ scf	8.235	*	1.038
VOC	NG Combustion	5.5	$lb/10^6$ scf	0.539	*	0.068
Lead	NG Combustion	0.0005	$lb/10^6$ scf	4.90E-05	*	6.18E-06

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[b]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM	NG Combustion	See PM_{10}	See PM_{10}	0.745	*	9.39E-02
Beryllium	NG Combustion	<1.2E-5	$lb/10^6$ scf	1.18E-06	*	1.48E-07
Mercury	NG Combustion	2.60E-04	$lb/10^6$ scf	2.55E-05	*	3.21E-06

Other Pollutants

Pollutant	Pollutant Source	Emission Factor[b]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
TOC	NG Combustion	11	$lb/10^6$ scf	1.08	*	0.136
Methane	NG Combustion	2.3	$lb/10^6$ scf	0.225	*	0.028
CO_2	NG Combustion	120,000	$lb/10^6$ scf	11,765	*	1,482
N_2O	NG Combustion	2.2	$lb/10^6$ scf	0.216	*	0.027

PM Grain Loading Standard[c]

Pollutant	Pollutant Source	Potential Emissions (lb/hr)	Grain Load @ 3% Oxygen (gr/dscf)	PM Grain Standard[c] (gr/dscf)	Meets Standard?
PM	NG Combustion	0.745	0.004	0.015	yes

Process Weight Rule - Not Applicable[d]

Notes:

(a) To facilitate operational flexibility, the four boilers at the facility are grouped in a bubble. The annual fuel consumption of the bubble will be limited, rather than the fuel consumption of the individual boilers. Detailed annual emission estimates for the "Boiler Bubble" are presented in a separate spreadsheet.

(b) Emission factors from AP-42 Chapter 1.4, "Natural Gas Combustion".

(c) IDAPA 58.01.01.677

(d) IDAPA 58.01.01.710.03 - The Murray 1 Boiler (B101) is subject to IDAPA 58.01.01.677; therefore, Subsection 710.08 is not applicable.

Toxic Air Pollutant Emissions
Burley Plant 1 - Murray 1 Boiler (B101)

Combustion Source Characteristics	
Boiler Manufacturer	Murray Boiler
Burner Model	Coen DAZ
Input Heat Capacity (BTU/hr)	100,000,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,020
Max Hourly Fuel Consumption (scf/hr)	98,039
Annual Fuel Consumption (scf/yr)[a]	"Bubbled"

Site Information	
Burley Barometric Pressure (mm Hg)	654.18

Stack Data	
Stack Height (ft)	40.7
Stack Diameter (ft)	5.00
Exit Gas Temperature (°F)	308
Wet Actual Flow Rate (acfm)	29,882
Wet Standard Flow Rate (wscfm)	17,683
Dry Standard Flow Rate (dscfm)	14,517
Grain Loading Flow Rate (dscfm)	19,691
Stack Velocity (m/s)	7.73
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Toxic Air Pollutants

Pollutant	Emission Factor[b]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (g/s)	Emission Limit[c] (lb/hr)	Modeling Required?[d]
Arsenic	2.00E-04	lb/10^6 scf	1.96E-05	2.47E-06	1.50E-06	yes
Barium	4.40E-03	lb/10^6 scf	4.31E-04	5.44E-05	3.30E-02	no
Benzene	2.10E-03	lb/10^6 scf	2.06E-04	2.59E-05	8.00E-04	no
Beryllium	<1.2E-5	lb/10^6 scf	1.18E-06	1.48E-07	2.80E-05	no
Benzo(a)pyrene	<1.2E-6	lb/10^6 scf	1.18E-07	1.48E-08	2.00E-06	no
Bis (2-ethylhexyl)phthalate	FNA	lb/10^6 scf	FNA	FNA	2.80E-02	no
Cadmium	1.10E-03	lb/10^6 scf	1.08E-04	1.36E-05	3.70E-06	yes
Chromium	1.40E-03	lb/10^6 scf	1.37E-04	1.73E-05	3.30E-02	no
Cobalt	8.40E-05	lb/10^6 scf	8.24E-06	1.04E-06	3.30E-03	no
Copper	8.50E-04	lb/10^6 scf	8.33E-05	1.05E-05	3.33E-01	no
Dibutylphthalate	FNA	lb/10^6 scf	FNA	FNA	6.70E-02	no
Dichlorobenzene	1.20E-03	lb/10^6 scf	1.18E-04	1.48E-05	2.00E+01	no
Ethylbenzene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01	no
Fluorene	2.80E-06	lb/10^6 scf	2.75E-07	3.46E-08	1.33E-01	no
Formaldehyde	7.50E-02	lb/10^6 scf	7.35E-03	9.26E-04	5.10E-04	yes
Hexane	1.80E+00	lb/10^6 scf	1.76E-01	2.22E-02	1.20E+01	no
Manganese	3.80E-04	lb/10^6 scf	3.73E-05	4.69E-06	3.33E-01	no
Mercury	2.60E-04	lb/10^6 scf	2.55E-05	3.21E-06	3.00E-03	no
Molybdenum	1.10E-03	lb/10^6 scf	1.08E-04	1.36E-05	3.33E-01	no
Napthalene	6.10E-04	lb/10^6 scf	5.98E-05	7.54E-06	3.33E+00	no
Nickel	2.10E-03	lb/10^6 scf	2.06E-04	2.59E-05	2.70E-05	yes
Pentane	2.60E+00	lb/10^6 scf	2.55E-01	3.21E-02	1.18E+02	no
Phenol	FNA	lb/10^6 scf	FNA	FNA	1.27E+00	no
Selenium	<2.4E-5	lb/10^6 scf	2.35E-06	2.96E-07	1.30E-02	no
Toluene	3.40E-03	lb/10^6 scf	3.33E-04	4.20E-05	2.50E+01	no
Vanadium	2.30E-03	lb/10^6 scf	2.25E-04	2.84E-05	3.00E-03	no
o-Xylene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01	no
Zinc	2.90E-02	lb/10^6 scf	2.84E-03	3.58E-04	6.67E-01	no

Notes:

(a) To facilitate operational flexibility, the four boilers at the facility are grouped in a bubble. The annual fuel consumption of the bubble will be limited, rather than the fuel consumption of the individual boilers. Detailed annual emission estimates for the "Boiler Bubble" are presented in a separate spreadsheet.

(b) Emission Factors from AP-42 Chapter 1.4, "Natural Gas Combustion".

(c) IDAPA 58.01.01.585 and 586

(d) IDAPA 58.01.01.210.05(b)

* FNA - Factor Not Available

Air Pollutant Emissions
Burley Plant 1 - Nebraska 1 Boiler (B102)

Combustion Source Characteristics

Boiler Manufacturer	Nebraska Boiler
Burner Model	Coen DAZ
Input Heat Capacity (BTU/hr)	95,580,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,020
Max Hourly Fuel Consumption (scf/hr)	93,706
Annual Fuel Consumption (scf/yr)[a]	"Bubbled"

Site Information

Burley Barometric Pressure (mm Hg)	654.18

Stack Data

Stack Height (ft)	64.9
Stack Diameter (ft)	4.00
Exit Gas Temperature (°F)	308
Wet Actual Flow Rate (acfm)	28,561
Wet Standard Flow Rate (wscfm)	16,902
Dry Standard Flow Rate (dscfm)	13,875
Grain Loading Flow Rate (dscfm)	18,821
Stack Velocity (m/s)	11.54
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[b]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM_{10}	NG Combustion	7.6	lb/10^6 scf	0.712	*	0.090
SO_2	NG Combustion	0.6	lb/10^6 scf	0.056	*	0.007
NO_x	NG Combustion	100	lb/10^6 scf	9.371	*	1.181
CO	NG Combustion	84	lb/10^6 scf	7.871	*	0.992
VOC	NG Combustion	5.5	lb/10^6 scf	0.515	*	0.065
Lead	NG Combustion	0.0005	lb/10^6 scf	4.69E-05	*	5.90E-06

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[b]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM	NG Combustion	See PM_{10}	See PM_{10}	0.712	*	8.97E-02
Beryllium	NG Combustion	<1.2E-5	lb/10^6 scf	1.12E-06	*	1.42E-07
Mercury	NG Combustion	2.60E-04	lb/10^6 scf	2.44E-05	*	3.07E-06

Other Pollutants

Pollutant	Pollutant Source	Emission Factor[b]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
TOC	NG Combustion	11	lb/10^6 scf	1.03	*	0.130
Methane	NG Combustion	2.3	lb/10^6 scf	0.216	*	0.027
CO_2	NG Combustion	120,000	lb/10^6 scf	11,245	*	1,417
N_2O	NG Combustion	2.2	lb/10^6 scf	0.206	*	0.026

PM Grain Loading Standard[c]

Pollutant	Pollutant Source	Potential Emissions (lb/hr)	Grain Load @ 3% Oxygen (gr/dscf)	PM Grain Standard[c] (gr/dscf)	Meets Standard?
PM	NG Combustion	0.712	0.004	0.015	yes

Process Weight Rule - Not Applicable[d]

Notes:

(a) To facilitate operational flexibility, the four boilers at the facility are grouped in a bubble. The annual fuel consumption of the bubble will be limited, rather than the fuel consumption of the individual boilers. Detailed annual emission estimates for the "Boiler Bubble" are presented in a separate spreadsheet.

(b) Emission factors from AP-42 Chapter 1.4, "Natural Gas Combustion".

(c) IDAPA 58.01.01.676

(d) IDAPA 58.01.01.710.03 - The Nebraska 1 Boiler (B102) is subject to IDAPA 58.01.01.676; therefore, Subsection 710.08 is not applicable.

Toxic Air Pollutant Emissions
Burley Plant 1 - Nebraska 1 Boiler (B102)

Combustion Source Characteristics	
Boiler Manufacturer	Nebraska Boiler
Burner Model	Coen DAZ
Input Heat Capacity (BTU/hr)	95,580,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,020
Max Hourly Fuel Consumption (scf/hr)	93,706
Annual Fuel Consumption (scf/yr)[a]	"Bubbled"

Site Information	
Burley Barometric Pressure (mm Hg)	654.18

Stack Data	
Stack Height (ft)	64.9
Stack Diameter (ft)	4.00
Exit Gas Temperature (°F)	308
Wet Actual Flow Rate (acfm)	28,561
Wet Standard Flow Rate (wscfm)	16,902
Dry Standard Flow Rate (dscfm)	13,875
Grain Loading Flow Rate (dscfm)	18,821
Stack Velocity (m/s)	11.54
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Toxic Air Pollutants

Pollutant	Emission Factor[b]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (g/s)	Emission Limit[c] (lb/hr)	Modeling Required?[d]
Arsenic	2.00E-04	lb/10^6 scf	1.87E-05	2.36E-06	1.50E-06	yes
Barium	4.40E-03	lb/10^6 scf	4.12E-04	5.20E-05	3.30E-02	no
Benzene	2.10E-03	lb/10^6 scf	1.97E-04	2.48E-05	8.00E-04	no
Beryllium	<1.2E-5	lb/10^6 scf	1.12E-06	1.42E-07	2.80E-05	no
Benzo(a)pyrene	<1.2E-6	lb/10^6 scf	1.12E-07	1.42E-08	2.00E-06	no
Bis (2-ethylhexyl)phthalate	FNA	lb/10^6 scf	FNA	FNA	2.80E-02	no
Cadmium	1.10E-03	lb/10^6 scf	1.03E-04	1.30E-05	3.70E-06	yes
Chromium	1.40E-03	lb/10^6 scf	1.31E-04	1.65E-05	3.30E-02	no
Cobalt	8.40E-05	lb/10^6 scf	7.87E-06	9.92E-07	3.30E-03	no
Copper	8.50E-04	lb/10^6 scf	7.97E-05	1.00E-05	3.33E-01	no
Dibutylphthalate	FNA	lb/10^6 scf	FNA	FNA	6.70E-02	no
Dichlorobenzene	1.20E-03	lb/10^6 scf	1.12E-04	1.42E-05	2.00E+01	no
Ethylbenzene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01	no
Fluorene	2.80E-06	lb/10^6 scf	2.62E-07	3.31E-08	1.33E-01	no
Formaldehyde	7.50E-02	lb/10^6 scf	7.03E-03	8.86E-04	5.10E-04	yes
Hexane	1.80E+00	lb/10^6 scf	1.69E-01	2.13E-02	1.20E+01	no
Manganese	3.80E-04	lb/10^6 scf	3.56E-05	4.49E-06	3.33E-01	no
Mercury	2.60E-04	lb/10^6 scf	2.44E-05	3.07E-06	3.00E-03	no
Molybdenum	1.10E-03	lb/10^6 scf	1.03E-04	1.30E-05	3.33E-01	no
Napthalene	6.10E-04	lb/10^6 scf	5.72E-05	7.20E-06	3.33E+00	no
Nickel	2.10E-03	lb/10^6 scf	1.97E-04	2.48E-05	2.70E-05	yes
Pentane	2.60E+00	lb/10^6 scf	2.44E-01	3.07E-02	1.18E+02	no
Phenol	FNA	lb/10^6 scf	FNA	FNA	1.27E+00	no
Selenium	<2.4E-5	lb/10^6 scf	2.25E-06	2.83E-07	1.30E-02	no
Toluene	3.40E-03	lb/10^6 scf	3.19E-04	4.01E-05	2.50E+01	no
Vanadium	2.30E-03	lb/10^6 scf	2.16E-04	2.72E-05	3.00E-03	no
o-Xylene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01	no
Zinc	2.90E-02	lb/10^6 scf	2.72E-03	3.42E-04	6.67E-01	no

Notes:

(a) To facilitate operational flexibility, the four boilers at the facility are grouped in a bubble. The annual fuel consumption of the bubble will be limited, rather than the fuel consumption of the individual boilers. Detailed annual emission estimates for the "Boiler Bubble" are presented in a separate spreadsheet.

(b) Emission Factors from AP-42 Chapter 1.4, "Natural Gas Combustion".

(c) IDAPA 58.01.01.585 and 586

(d) IDAPA 58.01.01.210.05(b)

* FNA - Factor Not Available

Air Pollutant Emissions
Burley Plant 2 - Nebraska 2 Boiler (B202)

Combustion Source Characteristics

Boiler Manufacturer	Nebraska Boiler
Burner Model	Coen DAZ
Input Heat Capacity (BTU/hr)	78,050,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,020
Max Hourly Fuel Consumption (scf/hr)	76,520
Annual Fuel Consumption (scf/yr)[a]	"Bubbled"

Site Information

Burley Barometric Pressure (mm Hg)	654.18

Stack Data

Stack Height (ft)	66.8
Stack Diameter (ft)	3.00
Exit Gas Temperature (°F)	308
Wet Actual Flow Rate (acfm)	23,323
Wet Standard Flow Rate (wscfm)	13,802
Dry Standard Flow Rate (dscfm)	11,330
Grain Loading Flow Rate (dscfm)	15,369
Stack Velocity (m/s)	16.76
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[b]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM_{10}	NG Combustion	7.6	lb/10^6 scf	0.582	*	0.073
SO_2	NG Combustion	0.6	lb/10^6 scf	0.046	*	0.006
NO_x	NG Combustion	100	lb/10^6 scf	7.652	*	0.964
CO	NG Combustion	84	lb/10^6 scf	6.428	*	0.810
VOC	NG Combustion	5.5	lb/10^6 scf	0.421	*	0.053
Lead	NG Combustion	0.0005	lb/10^6 scf	3.83E-05	*	4.82E-06

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[b]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM	NG Combustion	See PM_{10}	See PM_{10}	0.582	*	7.33E-02
Beryllium	NG Combustion	<1.2E-5	lb/10^6 scf	9.18E-07	*	1.16E-07
Mercury	NG Combustion	2.60E-04	lb/10^6 scf	1.99E-05	*	2.51E-06

Other Pollutants

Pollutant	Pollutant Source	Emission Factor[b]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
TOC	NG Combustion	11	lb/10^6 scf	0.84	*	0.106
Methane	NG Combustion	2.3	lb/10^6 scf	0.176	*	0.022
CO_2	NG Combustion	120,000	lb/10^6 scf	9,182	*	1,157
N_2O	NG Combustion	2.2	lb/10^6 scf	0.168	*	0.021

PM Grain Loading Standard[c]

Pollutant	Pollutant Source	Potential Emissions (lb/hr)	Grain Load @ 3% Oxygen (gr/dscf)	PM Grain Standard[c] (gr/dscf)	Meets Standard?
PM	NG Combustion	0.582	0.004	0.015	yes

Process Weight Rule - Not Applicable[d]

Notes:

(a) To facilitate operational flexibility, the four boilers at the facility are grouped in a bubble. The annual fuel consumption of the bubble will be limited, rather than the fuel consumption of the individual boilers. Detailed annual emission estimates for the "Boiler Bubble" are presented in a separate spreadsheet.

(b) Emission factors from AP-42 Chapter 1.4, "Natural Gas Combustion".

(c) IDAPA 58.01.01.676

(d) IDAPA 58.01.01.710.03 - The Nebraska 2 Boiler (B202) is subject to IDAPA 58.01.01.676; therefore, Subsection 710.08 is not applicable.

APPENDIX B

Modeling Memo

Toxic Air Pollutant Emissions
Burley Plant 2 - Nebraska 2 Boiler (B202)

Combustion Source Characteristics	
Boiler Manufacturer	Nebraska Boiler
Burner Model	Coen DAZ
Input Heat Capacity (BTU/hr)	78,050,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,020
Max Hourly Fuel Consumption (scf/hr)	76,520
Annual Fuel Consumption (scf/yr)[a]	"Bubbled"

Site Information	
Burley Barometric Pressure (mm Hg)	654.18

Stack Data	
Stack Height (ft)	66.8
Stack Diameter (ft)	3
Exit Gas Temperature (°F)	306
Wet Actual Flow Rate (acfm)	23,323
Wet Standard Flow Rate (wscfm)	13,802
Dry Standard Flow Rate (dscfm)	11,330
Grain Loading Flow Rate (dscfm)	15,369
Stack Velocity (m/s)	16.76
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Toxic Air Pollutants

Pollutant	Emission Factor[b]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (g/s)	Emission Limit[c] (lb/hr)	Modeling Required?[d]
Arsenic	2.00E-04	lb/10^6 scf	1.53E-05	1.93E-06	1.50E-06	yes
Barium	4.40E-03	lb/10^6 scf	3.37E-04	4.24E-05	3.30E-02	no
Benzene	2.10E-03	lb/10^6 scf	1.61E-04	2.02E-05	8.00E-04	no
Beryllium	<1.2E-5	lb/10^6 scf	9.18E-07	1.16E-07	2.80E-05	no
Benzo(a)pyrene	<1.2E-6	lb/10^6 scf	9.18E-08	1.16E-08	2.00E-06	no
Bis (2-ethylhexyl)phthalate	FNA	lb/10^6 scf	FNA	FNA	2.80E-02	no
Cadmium	1.10E-03	lb/10^6 scf	8.42E-05	1.06E-05	3.70E-06	yes
Chromium	1.40E-03	lb/10^6 scf	1.07E-04	1.35E-05	3.30E-02	no
Cobalt	8.40E-05	lb/10^6 scf	6.43E-06	8.10E-07	3.30E-03	no
Copper	8.50E-04	lb/10^6 scf	6.50E-05	8.20E-06	3.33E-01	no
Dibutylphthalate	FNA	lb/10^6 scf	FNA	FNA	6.70E-02	no
Dichlorobenzene	1.20E-03	lb/10^6 scf	9.18E-05	1.16E-05	2.00E+01	no
Ethylbenzene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01	no
Fluorene	2.80E-06	lb/10^6 scf	2.14E-07	2.70E-08	1.33E-01	no
Formaldehyde	7.50E-02	lb/10^6 scf	5.74E-03	7.23E-04	5.10E-04	yes
Hexane	1.80E+00	lb/10^6 scf	1.38E-01	1.74E-02	1.20E+01	no
Manganese	3.80E-04	lb/10^6 scf	2.91E-05	3.66E-06	3.33E-01	no
Mercury	2.60E-04	lb/10^6 scf	1.99E-05	2.51E-06	3.00E-03	no
Molybdenum	1.10E-03	lb/10^6 scf	8.42E-05	1.06E-05	3.33E-01	no
Napthalene	6.10E-04	lb/10^6 scf	4.67E-05	5.88E-06	3.33E+00	no
Nickel	2.10E-03	lb/10^6 scf	1.61E-04	2.02E-05	2.70E-05	yes
Pentane	2.60E+00	lb/10^6 scf	1.99E-01	2.51E-02	1.18E+02	no
Phenol	FNA	lb/10^6 scf	FNA	FNA	1.27E+00	no
Selenium	<2.4E-5	lb/10^6 scf	1.84E-06	2.31E-07	1.30E-02	no
Toluene	3.40E-03	lb/10^6 scf	2.60E-04	3.28E-05	2.50E+01	no
Vanadium	2.30E-03	lb/10^6 scf	1.76E-04	2.22E-05	3.00E-03	no
o-Xylene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01	no
Zinc	2.90E-02	lb/10^6 scf	2.22E-03	2.80E-04	6.67E-01	no

Notes:

(a) To facilitate operational flexibility, the four boilers at the facility are grouped in a bubble. The annual fuel consumption of the bubble will be limited, rather than the fuel consumption of the individual boilers. Detailed annual emission estimates for the "Boiler Bubble" are presented in a separate spreadsheet.

(b) Emission Factors from AP-42 Chapter 1.4, "Natural Gas Combustion".

(c) IDAPA 58.01.01.585 and 586

(d) IDAPA 58.01.01.210.05(b)

* FNA - Factor Not Available

Air Pollutant Emissions
Burley Plant 2 - Murray 2 Boiler (B203)

Combustion Source Characteristics	
Boiler Manufacturer	Murray Boiler
Burner Model	Coen DAZ
Input Heat Capacity (BTU/hr)	39,100,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,020
Max Hourly Fuel Consumption (scf/hr)	38,333
Annual Fuel Consumption (scf/yr)[a]	"Bubbled"

Site Information	
Burley Barometric Pressure (mm Hg)	654.18

Stack Data	
Stack Height (ft)	37.9
Stack Diameter (ft)	3.00
Exit Gas Temperature (°F)	308
Wet Actual Flow Rate (acfm)	11,684
Wet Standard Flow Rate (wscfm)	6,914
Dry Standard Flow Rate (dscfm)	5,676
Grain Loading Flow Rate (dscfm)	7,699
Stack Velocity (m/s)	8.39
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Criteria Pollutants

Pollutant	Pollutant Source	Emission Factor[b]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM_{10}	NG Combustion	7.6	$lb/10^6$ scf	0.291	*	0.037
SO_2	NG Combustion	0.6	$lb/10^6$ scf	0.023	*	0.003
NO_x	NG Combustion	100	$lb/10^6$ scf	3.833	*	0.483
CO	NG Combustion	84	$lb/10^6$ scf	3.220	*	0.406
VOC	NG Combustion	5.5	$lb/10^6$ scf	0.211	*	0.027
Lead	NG Combustion	0.0005	$lb/10^6$ scf	1.92E-05	*	2.42E-06

Non-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor[b]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
PM	NG Combustion	See PM_{10}	See PM_{10}	0.291	*	3.67E-02
Beryllium	NG Combustion	<1.2E-5	$lb/10^6$ scf	4.60E-07	*	5.80E-08
Mercury	NG Combustion	2.60E-04	$lb/10^6$ scf	9.97E-06	*	1.26E-06

Other Pollutants

Pollutant	Pollutant Source	Emission Factor[b]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
TOC	NG Combustion	11	$lb/10^6$ scf	0.42	*	0.053
Methane	NG Combustion	2.3	$lb/10^6$ scf	0.088	*	0.011
CO_2	NG Combustion	120,000	$lb/10^6$ scf	4,600	*	580
N_2O	NG Combustion	2.2	$lb/10^6$ scf	0.084	*	0.011

PM Grain Loading Standard[c]

Pollutant	Pollutant Source	Potential Emissions (lb/hr)	Grain Load @ 3% Oxygen (gr/dscf)	PM Grain Standard[c] (gr/dscf)	Meets Standard?
PM	NG Combustion	0.291	0.004	0.015	yes

Process Weight Rule - Not Applicable[d]

Notes:

(a) To facilitate operational flexibility, the four boilers at the facility are grouped in a bubble. The annual fuel consumption of the bubble will be limited, rather than the fuel consumption of the individual boilers. Detailed annual emission estimates for the "Boiler Bubble" are presented in a separate spreadsheet.

(b) Emission factors from AP-42 Chapter 1.4, "Natural Gas Combustion".

(c) IDAPA 58.01.01.677

(d) IDAPA 58.01.01.710.03 - The Murray 2 Boiler (B202) is subject to IDAPA 58.01.01.677; therefore, Subsection 710.08 is not applicable.

Toxic Air Pollutant Emissions
Burley Plant 2 - Murray 2 Boiler (B203)

Combustion Source Characteristics

Boiler Manufacturer	Murray Boiler
Burner Model	Coen DAZ
Input Heat Capacity (BTU/hr)	39,100,000
Fuel	Natural Gas
Heating Value (BTU/scf)	1,020
Max Hourly Fuel Consumption (scf/hr)	38,333
Annual Fuel Consumption (scf/yr)[a]	"Bubbled"

Site Information

Burley Barometric Pressure (mm Hg)	654.18

Stack Data

Stack Height (ft)	37.9
Stack Diameter (ft)	3.00
Exit Gas Temperature (°F)	308
Wet Actual Flow Rate (acfm)	11,684
Wet Standard Flow Rate (wscfm)	6,914
Dry Standard Flow Rate (dscfm)	5,676
Grain Loading Flow Rate (dscfm)	7,699
Stack Velocity (m/s)	8.39
Fd (dscf stack gas/BTU)	0.00871
Fw (wscf stack gas/BTU)	0.01061

Toxic Air Pollutants

Pollutant	Emission Factor[b]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (g/s)	Emission Limit[c] (lb/hr)	Modeling Required?[d]
Arsenic	2.00E-04	lb/10^6 scf	7.67E-06	9.66E-07	1.50E-06	yes
Barium	4.40E-03	lb/10^6 scf	1.69E-04	2.13E-05	3.30E-02	no
Benzene	2.10E-03	lb/10^6 scf	8.05E-05	1.01E-05	8.00E-04	no
Beryllium	<1.2E-5	lb/10^6 scf	4.60E-07	5.80E-08	2.80E-05	no
Benzo(a)pyrene	<1.2E-6	lb/10^6 scf	4.60E-08	5.80E-09	2.00E-06	no
Bis (2-ethylhexyl)phthalate	FNA	lb/10^6 scf	FNA	FNA	2.80E-02	no
Cadmium	1.10E-03	lb/10^6 scf	4.22E-05	5.31E-06	3.70E-06	yes
Chromium	1.40E-03	lb/10^6 scf	5.37E-05	6.76E-06	3.30E-02	no
Cobalt *	8.40E-05	lb/10^6 scf	3.22E-06	4.06E-07	3.30E-03	no
Copper	8.50E-04	lb/10^6 scf	3.26E-05	4.11E-06	3.33E-01	no
Dibutylphthalate	FNA	lb/10^6 scf	FNA	FNA	6.70E-02	no
Dichlorobenzene	1.20E-03	lb/10^6 scf	4.60E-05	5.80E-06	2.00E+01	no
Ethylbenzene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01	no
Fluorene	2.80E-06	lb/10^6 scf	1.07E-07	1.35E-08	1.33E-01	no
Formaldehyde	7.50E-02	lb/10^6 scf	2.88E-03	3.62E-04	5.10E-04	yes
Hexane	1.80E+00	lb/10^6 scf	6.90E-02	8.69E-03	1.20E+01	no
Manganese	3.80E-04	lb/10^6 scf	1.46E-05	1.84E-06	3.33E-01	no
Mercury	2.60E-04	lb/10^6 scf	9.97E-06	1.26E-06	3.00E-03	no
Molybdenum	1.10E-03	lb/10^6 scf	4.22E-05	5.31E-06	3.33E-01	no
Napthalene	6.10E-04	lb/10^6 scf	2.34E-05	2.95E-06	3.33E+00	no
Nickel	2.10E-03	lb/10^6 scf	8.05E-05	1.01E-05	2.70E-05	yes
Pentane	2.60E+00	lb/10^6 scf	9.97E-02	1.26E-02	1.18E+02	no
Phenol	FNA	lb/10^6 scf	FNA	FNA	1.27E+00	no
Selenium	<2.4E-5	lb/10^6 scf	9.20E-07	1.16E-07	1.30E-02	no
Toluene	3.40E-03	lb/10^6 scf	1.30E-04	1.64E-05	2.50E+01	no
Vanadium	2.30E-03	lb/10^6 scf	8.82E-05	1.11E-05	3.00E-03	no
o-Xylene	FNA	lb/10^6 scf	FNA	FNA	2.90E+01	no
Zinc	2.90E-02	lb/10^6 scf	1.11E-03	1.40E-04	6.67E-01	no

Notes:

(a) To facilitate operational flexibility, the four boilers at the facility are grouped in a bubble. The annual fuel consumption of the bubble will be limited, rather than the fuel consumption of the individual boilers. Detailed annual emission estimates for the "Boiler Bubble" are presented in a separate spreadsheet.

(b) Emission Factors from AP-42 Chapter 1.4, "Natural Gas Combustion".

(c) IDAPA 58.01.01.585 and 586

(d) IDAPA 58.01.01.210.05(b)

* FNA - Factor Not Available

Annual Air Pollutant Emissions
Boiler Bubble

Combustion Source Characteristics

	Natural Gas
ing Value (BTU/scf)	1,020
ual Fuel Consumption (scf/yr)[a]	1,100,000,000

eria Pollutants

Pollutant	Pollutant Source	Emission Factor [b]	Emission Factor Unit	Potential Emissions (TPY)	Significant Level[c] (TPY)	Below Regulatory Concern?[d]	Significant Contribution?[c]
PM_{10}	NG Combustion	7.6	lb/10^6 scf	4.180	15	no	no
SO_2	NG Combustion	0.6	lb/10^6 scf	0.330	40	yes	no
NO_x	NG Combustion	100	lb/10^6 scf	55.000	40	no	yes
CO	NG Combustion	84	lb/10^6 scf	46.200	100	no	no
VOC	NG Combustion	5.5	lb/10^6 scf	3.025	40	yes	no
Lead	NG Combustion	0.0005	lb/10^6 scf	2.75E-04	0.6	yes	no

-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor [b]	Emission Factor Unit	Potential Emissions (TPY)	Significant Level[c] (TPY)	Below Regulatory Concern?[d]	Significant Contribution?[c]
PM	NG Combustion & Process	See PM_{10}	See PM_{10}	4.180	25	no	no
Beryllium	NG Combustion	<1.2E-5	lb/10^6 scf	6.60E-06	0.0004	yes	no
Mercury	NG Combustion	2.60E-04	lb/10^6 scf	1.43E-04	0.1	yes	no

ır Pollutants

Pollutant	Pollutant Source	Emission Factor [b]	Emission Factor Unit	Potential Emissions (TPY)
TOC	NG Combustion	11	lb/10^6 scf	6.050
Methane	NG Combustion	2.3	lb/10^6 scf	1.265
CO_2	NG Combustion	120,000	lb/10^6 scf	66,000
N_2O	NG Combustion	2.2	lb/10^6 scf	1.210

s:

o facilitate operational flexibility, the four boilers at the facility are grouped in a bubble. The annual uel consumption of the bubble will be monitored and limited to 1,100,000,000 scf/yr

)APA 58.01.01.006.92
)APA 58.01.01.221.01

Annual Toxic Air Pollutant Emissions
Boiler Bubble

Combustion Source Characteristics

Fuel	Natural Gas
Heating Value (BTU/scf)	1,020
Annual Fuel Consumption (scf/yr)[a]	1,100,000,000

Toxic Air Pollutants

Pollutant	Emission Factor[b]	Emission Factor Unit	Potential Emissions (TPY)
Arsenic	2.00E-04	lb/10^6 scf	1.10E-04
Barium	4.40E-03	lb/10^6 scf	2.42E-03
Benzene	2.10E-03	lb/10^6 scf	1.16E-03
Beryllium	<1.2E-5	lb/10^6 scf	6.60E-06
Benzo(a)pyrene	<1.2E-6	lb/10^6 scf	6.60E-07
Bis (2-ethylhexyl)phthalate	FNA	lb/10^6 scf	FNA
Cadmium	1.10E-03	lb/10^6 scf	6.05E-04
Chromium	1.40E-03	lb/10^6 scf	7.70E-04
Cobalt	8.40E-05	lb/10^6 scf	4.62E-05
Copper	8.50E-04	lb/10^6 scf	4.68E-04
Dibutylphthalate	FNA	lb/10^6 scf	FNA
Dichlorobenzene	1.20E-03	lb/10^6 scf	6.60E-04
Ethylbenzene	FNA	lb/10^6 scf	FNA
Fluorene	2.80E-06	lb/10^6 scf	1.54E-06
Formaldehyde	7.50E-02	lb/10^6 scf	4.13E-02
Hexane	1.80E+00	lb/10^6 scf	9.90E-01
Manganese	3.80E-04	lb/10^6 scf	2.09E-04
Mercury	2.60E-04	lb/10^6 scf	1.43E-04
Molybdenum	1.10E-03	lb/10^6 scf	6.05E-04
Napthalene	6.10E-04	lb/10^6 scf	3.36E-04
Nickel	2.10E-03	lb/10^6 scf	1.16E-03
Pentane	2.60E+00	lb/10^6 scf	1.43E+00
Phenol	FNA	lb/10^6 scf	FNA
Selenium	<2.4E-5	lb/10^6 scf	1.32E-05
Toluene	3.40E-03	lb/10^6 scf	1.87E-03
Vanadium	2.30E-03	lb/10^6 scf	1.27E-03
o-Xylene	FNA	lb/10^6 scf	FNA
Zinc	2.90E-02	lb/10^6 scf	1.60E-02

Notes:

(a) To facilitate operational flexibility, the four boilers at the facility are grouped in a bubble. The annual fuel consumption of the bubble will be monitored and limited to 1,100,000,000 scf/yr

(b) Emission Factors from AP-42 Chapter 1.4, "Natural Gas Combustion".

* FNA - Factor Not Available

Emission Calculations - Batter Room Dust Collector (E209)

Description

Several of the potato products processed at the McCain Foods facility in Burley, Idaho are battered. Batters are prepared from various dry ingredients, such as starch and seasonings, in the Batter Room in the Burley 2 Plant. Particulate matter is filtered from the air in the Batter Room via a dust control system that is manufactured by DCE, Inc. The system consists of a cased group of filter elements and is equipped with its own fan and discharge arrangements.

PM / PM_{10} Emission Rates

Equipment Data:

Model:	Dalamatic Dust Control Unit
Unit Designation Number	DU204F6AD
Outlet Emission Rate	0.00437-0.00874 gr/dscf
Fan Designation	F6 Fan Size
Fan Air Volume	1,600 dscfm
No. of Filter Elements	20
Envelope Length	39.5"
Dust Container Volume	4 ft^3

Calculations:

$$PM_{10}\ \text{Hourly Emission Rate} = \frac{(0.00874\ \text{gr/dscf}) \times (1{,}600\ \text{dscfm}) \times (60\ \text{min/hr})}{(7{,}000\ \text{gr/lb})}$$

PM_{10} Hourly Emission Rate = 0.120 lb/hr

$$PM_{10}\ \text{Annual Emission Rate} = \frac{(0.120\ \text{lb/hr}) \times (8{,}760\ \text{hr/yr})}{(2000\ \text{lb/ton})}$$

PM_{10} Annual Emission Rate = 0.525 ton/yr

Process Weight Rule Compliance - Exempt

This emission source qualifies for the De Minimis Exception per IDAPA 58.01.01.710.02.

Air Pollutant Emissions
Emergency Fire Pump (E001)

Combustion Source Characteristics

ıufacturer	Detroit Diesel
del	6061-A2
wer Output (hp)	170
el	Diesel
ted Input (MMBTU/hr)	0.844
ating Value (BTU/lb)	19,300

Site Information

rley Barometric Pressure (mm Hg)	654.18
tual Hours of Operation (hr/yr)	104

Stack Data

Stack Height (ft)	6.08
Stack Diameter (ft)	0.33
Exit Gas Temperature (°F)	445
Wet Actual Flow Rate (acfm)	289
Wet Standard Flow Rate (wscfm)	145
Dry Standard Flow Rate (dscfm)	129
Stack Velocity (m/s)	16.8
Fd (dscf stack gas/BTU)	0.00919
Fw (wscf stack gas/BTU)	0.01032

riteria Pollutants

Pollutant	Pollutant Source	Emission Factor [a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)	Significant Level[b] (TPY)	Below Regulatory Concern?[c]	Significant Contribution ?[b]
PM_{10}	Diesel Combustion	2.20E-03	lb/hp-hr	0.374	0.019	0.047	15	yes	no
SO_2 (SO_x Basis)	Diesel Combustion	2.05E-03	lb/hp-hr	0.349	0.018	0.044	40	yes	no
NO_x	Diesel Combustion	0.031	lb/hp-hr	5.270	0.274	0.664	40	yes	no
CO	Diesel Combustion	6.68E-03	lb/hp-hr	1.136	0.059	0.143	100	yes	no
/OC (TOC Basis)	Diesel Combustion	2.51E-03	lb/hp-hr	0.427	0.022	0.054	40	yes	no
Lead	Diesel Combustion	FNA	FNA	FNA	FNA	FNA	0.6	yes	no

on-Criteria Pollutants with Significant Threshold

Pollutant	Pollutant Source	Emission Factor [a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)	Significant Level[b] (TPY)	Below Regulatory Concern?[c]	Significant Contribution ?[b]
PM	Diesel Combustion	See PM_{10}	See PM_{10}	0.374	0.019	0.047	25	yes	no
Beryllium	Diesel Combustion	FNA	FNA	FNA	FNA	FNA	0.0004	FNA	FNA
Mercury	Diesel Combustion	FNA	FNA	FNA	FNA	FNA	0.1	FNA	FNA

ther Pollutants

Pollutant	Pollutant Source	Emission Factor [a]	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (TPY)	Potential Emissions (g/s)
TOC	Diesel Combustion	2.51E-03	lb/hp-hr	0.427	0.022	0.054
Methane	Diesel Combustion	FNA	FNA	FNA	FNA	FNA
CO_2	Diesel Combustion	1.15	lb/hp-hr	196	10.166	24.633
N_2O	Diesel Combustion	FNA	FNA	FNA	FNA	FNA

M Grain Loading Standard[d]: Not Applicable

rocess Weight Rule - Exempt[e]

lotes:

a) Emission Factors from AP-42 Chapter 3.3, "Gasoline and Diesel Industrial Engines".

b) IDAPA 58.01.01.006.92

c) IDAPA 58.01.01.221.01

d) IDAPA 58.01.01.676 or 677.- The fire pump does not satisfy the definition of "fuel burning equipment" as presented in IDAPA 58.01.01.006.41.

) IDAPA 58.01.01.710.02 - This emission source qualifies for the De Minimis Exception

FNA - Factor Not Available

Toxic Air Pollutant Emissions
Emergency Fire Pump (E001)

Combustion Source Characteristics

Manufacturer	Detroit Diesel
Model	6061-A2
Power Output (hp)	170
Fuel	Diesel
Rated Input (MMBTU/hr)	0.844
Heating Value (BTU/lb)	19,300

Site Information

Burley Barometric Pressure (mm Hg)	654.18
Actual Hours of Operation (hr/yr)	104

Stack Data

Stack Height (ft)	6.08
Stack Diameter (ft)	0.33
Exit Gas Temperature (°F)	445
Wet Actual Flow Rate (acfm)	289
Wet Standard Flow Rate (wscfm)	145
Dry Standard Flow Rate (dscfm)	129
Stack Velocity (m/s)	16.8
Fd (dscf stack gas/BTU)	0.00919
Fw (wscf stack gas/BTU)	0.01032

Toxic Air Pollutants

Pollutant	Emission Factor *	Emission Factor Unit	Potential Emissions (lb/hr)	Potential Emissions (g/s)	Emission Limit[b] (lb/hr)	Modeling Required?[c]
Arsenic	FNA	FNA	FNA	FNA	1.50E-06	no
Barium	FNA	FNA	FNA	FNA	3.30E-02	no
Benzene	9.33E-04	lb/MMBTU	7.87E-04	9.92E-05	8.00E-04	no
Beryllium	FNA	FNA	FNA	FNA	2.80E-05	no
Benzo(e)pyrene	1.88E-07	lb/MMBTU	1.59E-07	2.00E-08	2.00E-06	no
Bis (2-ethylhexyl)phthalate	FNA	FNA	FNA	FNA	2.80E-02	no
Cadmium	FNA	FNA	FNA	FNA	3.70E-06	no
Chromium	FNA	FNA	FNA	FNA	3.30E-02	no
Cobalt	FNA	FNA	FNA	FNA	3.30E-03	no
Copper	FNA	FNA	FNA	FNA	3.33E-01	no
Dibutylphthalate	FNA	FNA	FNA	FNA	6.70E-02	no
Dichlorobenzene	FNA	FNA	FNA	FNA	2.00E+01	no
Ethylbenzene	FNA	FNA	FNA	FNA	2.90E+01	no
Fluorene	2.92E-05	lb/MMBTU	2.46E-05	3.11E-06	1.33E-01	no
Formaldehyde	1.18E-03	lb/MMBTU	9.96E-04	1.25E-04	5.10E-04	yes
Hexane	FNA	FNA	FNA	FNA	1.20E+01	no
Manganese	FNA	FNA	FNA	FNA	3.33E-01	no
Mercury	FNA	FNA	FNA	FNA	3.00E-03	no
Molybdenum	FNA	FNA	FNA	FNA	3.33E-01	no
Napthalene	8.48E-05	lb/MMBTU	7.16E-05	9.02E-06	3.33E+00	no
Nickel	FNA	FNA	FNA	FNA	2.70E-05	no
Pentane	FNA	FNA	FNA	FNA	1.18E+02	no
Phenol	FNA	FNA	FNA	FNA	1.27E+00	no
Selenium	FNA	FNA	FNA	FNA	1.30E-02	no
Toluene	4.09E-04	lb/MMBTU	3.45E-04	4.35E-05	2.50E+01	no
Vanadium	FNA	FNA	FNA	FNA	3.00E-03	no
o-Xylene (Based on Xylenes)	2.85E-04	lb/MMBTU	2.41E-04	3.03E-05	2.90E+01	no
Zinc	FNA	FNA	FNA	FNA	6.67E-01	no

Notes:
(a) Emission Factors from AP-42 Chapter 3.3, "Gasoline and Diesel Industrial Engines".
(b) IDAPA 58.01.01.585 and 586
(c) IDAPA 58.01.01.210.05(b)
* FNA - Factor Not Available

combination with other contaminants, injure or unreasonably affect human or animal life or vegetation." To demonstrate compliance with this requirement, an inventory of all TAP emissions at the facility was performed. IDAPA 58.01.01.585 and 586 provide a list of compounds that are considered TAPs. The list also provides screening emission levels and acceptable ambient concentrations that are used for evaluating proposed new sources. The following is a description of DEQ's method for evaluating compliance with IDAPA 58.01.01.161 with regard to this Facility-wide Tier II OP application:

1) Inventory all TAP emissions at the facility. The lb/hr value associated with maximum 24-hour averaged emissions is used for non-carcinogenic TAPs listed in IDAPA 58.01.01.585, and the lb/hr value associated with maximum annual averaged emissions is used for carcinogenic TAPs listed in IDAPA 58.01.01.586.

2) Compare facility-wide TAP emissions with screening emission levels provided in IDAPA 58.01.01.585 and 586. If emissions are less than screening levels, then no further analyses are required.

3) Non-carcinogenic TAPs with emissions that exceed the screening levels must be modeled to evaluate the maximum 24-hour impact to ambient air. If maximum impacts are less than the applicable acceptable ambient concentration (AAC), then no further analyses are required. If maximum impacts are greater than AACs, approval will be evaluated on a case-by-case basis, considering:

   - uncertainty of emission factors and human health impact data,
   - magnitude and frequency of modeled impacts exceeding the AAC,
   - public access to the area(s) where modeled impacts exceed the AAC,
   - specific toxicological factors of the TAP.

4) Carcinogenic TAPs with emissions that exceed the screening levels must be modeled to evaluate the maximum annual impact to ambient air. The individual cancer risk associated with the maximum long-term modeled concentration will be calculated from the Unit Risk Factor (URF), given in IDAPA 58.01.01.586, for each carcinogenic TAP emission that exceeds the screening level. Impacts are considered acceptable if the maximum cumulative risk (calculated by summing the risk of all modeled carcinogenic TAPs) is less than 1.0 E-5 (1 in 100,000).

Table 1. Applicable Regulatory Limits

Pollutant	Averaging Period	Regulatory Limit[a] ($\mu g/m^3$)[b]	Modeled Value Used[c]
Oxides of nitrogen	Annual	100[e]	1st highest
Sulfur dioxide	3-hour	1,300[f]	2nd highest
	24-hour	365[f]	2nd highest
	Annual	80[e]	1st highest
Carbon monoxide	1-hour	40,000[f]	2nd highest
	8-hour	10,000[f]	2nd highest
PM_{10}[d]	24-hour	150[f]	6th highest
	Annual	50[e]	1st highest

[a] IDAPA 58.01.01.577
[b] Micrograms per cubic meter
[c] When using five years of meteorological data
[d] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
[e] Not to be exceeded
[f] Not to be exceeded more than once per year

2.3 *Background Concentrations*

DEQ provided McCain Foods with appropriate background concentrations for use in the Tier II OP application. Background PM_{10} concentrations were obtained from monitoring data collected in Rupert, Idaho. Statewide background concentrations were used for all other criteria pollutants. Table 2 lists applicable background concentrations.

Table 2. Background Concentrations

Pollutant	Averaging Period	Background Concentration (µg/m³)[a]
Oxides of nitrogen (NO_2)	Annual	40
Sulfur dioxide (SO_2)	3-hour	374
	24-hour	120
	Annual	18.3
Carbon monoxide (CO)	1-hour	11,450
	8-hour	5,130
PM_{10}[b]	24-hour	100
	Annual	25.1

[a] Micrograms per cubic meter
[b] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

2.4 *Modeling Impact Assessment*

Ambient impact analyses were performed by McCain Foods' consultant, Millennium Science & Engineering, Inc. (MSE), using the model ISCST3 - VERSION 00101. A modeling protocol was submitted to and approved by DEQ prior to submittal of the Tier II OP application. Table 3 provides a summary of modeling parameters used.

Table 3. Modeling Parameters

Parameter	Description/Values	Documentation/Additional Description
Model	ISCST3	Version 0010
Meteorological Data	Pocatello, Idaho (surface) Boise, Idaho (upper air)	1987-1991
Model Options	Regulatory Default	
Land Use	Rural	
Terrain	Simple	Approved by DEQ provided maximum impacts are near the facility property boundary
Building Downwash	Used BPIP program and building dimensions	See Figure 1 and 2 for building, source, and receptor locations
Receptor grids See Figure 1	Grid 1	30 meter spacing along site boundary out to 90 meters
	Grid 2	100 meter spacing out to about 300 meters from the east-most boundary point, 500 meters from the southern and western boundary, 800 meters from the north-most boundary point

Meteorological data were not available for the Burley area. Therefore, Pocatello surface data were used in combination with Boise upper air data. Use ofthese data did not enable consideration of local meteorological effects induced by the presence of the Snake River. This limitation did not likely result in a substantial change in the results ofthe analyses.

DEQ checked the ISCST3 meteorological input file used by the applicant against DEQ generated meteorological files. For five years of hourly data, differences between the files were found for eight hours of data. Although the differences would not likely result in any change in the modeling results, DEQ verification modeling was performed using meteorological files consistent with DEQ generated data.

DEQ performed verification modeling, using ISCST3 – Version 02035, to check the results submitted by the applicant. Differences between results for the two versions of ISCST3 were negligible.

Table 4 provides a summary of emission rates used in the criteria pollutant modeling analyses and Table 5 provides a summary of emission rates used in the TAP modeling analyses. Compliance with annual air quality standards was conservatively based on using maximum hourly emission rates rather than maximum annual emission rates. Ambient impacts from allowable annual emissions would be less than those indicated fom using maximum hourly rates. McCain Foods also requested an annual emission bubble for the boilers (a single emission limit for the combination of the four boilers). However, the annual ambient impacts were based on the maximum hourly emission rates from each boiler, assuming each boiler operates continuously throughout the year. This approach results in the use of emission rates for modeling that are considerably greater than permitted allowable rates. Consequently, the actual ambient impacts will likely be less than those predicted by the atmospheric dispersion modeling.

Table 4. Pollutant Emission Rates Used for Criteria Pollutant Modeling

Source (Id Code)	Maximum Hourly Emission Rate[a] (lb/hr)[c]				Hourly Rate use for Annual Modeling[b] (lb/hr)			
Pollutant	PM_{10}[d]	SO_2[e]	NO_x[f]	CO[g]	PM_{10}	SO_2	NO_x	CO
Party Fryer Air Washer (F108)	1.30	NA	NM[i]	NA	1.30	NA	NA	NM[i]
Tot Fryer Air Washer (F103)	4.08	NA	NM[i]	NA	4.08	NA	NA	NM[i]
Prime 1 Fryer Air Washer (F104)	2.68	NA	NM[i]	NA	2.68	NA	NA	NM[i]
Prime 2 Fryer Air Washer (F204)	2.25	NA	NM[i]	NA	2.25	NA	NA	NM[i]
Tot Dryer (D107)	2.00	0.00235	NM[i]	1.46	2.00	0.00235	0.603	NM[i]
Prime 1 Dryer (D105 and D106)[h]	3.35	0.00397	NM[i]	2.56	3.35	0.00397	1.05	NM[i]
Prime 2 Dryer (D205 – D208)[h]	1.41	0.00794	NM[i]	4.39	1.41	0.00794	1.80	NM[i]
Murray 1 Boiler (B101)	0.75	0.0556	NM[i]	8.24	0.75	0.0556	9.80	NM[i]
Murray 2 Boiler (B203)	0.29	0.0238	NM[i]	3.22	0.29	0.0238	3.83	NM[i]
Nebraska 1 Boiler (B102)	0.71	0.0556	NM[i]	7.87	0.71	0.0556	9.37	NM[i]
Nebraska 2 Boiler (B202)	0.58	0.0476	NM[i]	6.43	0.58	0.0476	7.65	NM[i]
Batter Room Dust Collector (E209)	0.12	NA	NM[i]	NA	0.12	NA	NA	NM[i]
Emergency Fire Pump (E001)	0.37	0.349	NM[i]	1.14	0.37	0.349	5.27	NM[i]

[a] Emission rate used for 24-, 8-, 3-, and 1-hour averaging periods
[b] Emission rate used for annual averaging period
[c] Pounds per hour
[d] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
[e] Sulfur dioxide
[f] Oxides of nitrogen
[g] Carbon monoxide
[h] Emissions rate per each unit
[i] Not modeled because there is no applicable standard for the specified averaging time

Table 5. Pollutant Emission Rates Used for TAP Modeling

Source (Id Code)	Hourly Rate use for Modeling (lb/hr)[a]					
Pollutant	Hydrogen Sulfide[b]	Arsenic[c]	Benzene[c]	Cadmium[c]	Formal-dehyde[c]	Nickel[c]
Party Fryer Air Washer (F108)	NA	NA	NA	NA	NA	NA
Tot Fryer Air Washer (F103)	NA	NA	NA	NA	NA	NA
Prime 1 Fryer Air Washer (F104)	NA	NA	NA	NA	NA	NA
Prime 2 Fryer Air Washer (F204)	NA	NA	NA	NA	NA	NA
Tot Dryer (D107)	NA	7.84E-7	8.25E-6	4.32E-6	2.94E-4	8.25E-6
Prime 1 Dryer (D105 and D106)[d]	NA	1.37E-6	1.44E-5	1.54E-5	5.16E-4	1.44E-5
Prime 2 Dryer (D205 – D208)[d]	NA	2.36E-6	2.48E-5	1.29E-5	8.83E-4	2.48E-5
Murray 1 Boiler (B101)	NA	1.96E-5	2.06E-4	1.08E-4	7.35E-3	2.06E-4
Murray 2 Boiler (B203)	NA	7.67E-6	8.02E-5	4.21E-5	2.87E-3	8.02E-5

Table 5. Pollutant Emission Rates Used for TAP Modeling

Source (Id Code)	Hourly Rate use for Modeling (lb/hr)[a]					
Pollutant	Hydrogen Sulfide[b]	Arsenic[c]	Benzene[c]	Cadmium[c]	Formal-dehyde[c]	Nickel[c]
Nebraska 1 Boiler (B102)	NA	1.87E-5	1.97E-4	1.03E-4	7.03E-3	1.97E-4
Nebraska 2 Boiler (B202)	NA	1.53E-5	1.60E-4	8.41E-5	5.74E-3	1.60E-4
Batter Room Dust Collector (E209)	NA	NA	NA	NA	NA	NA
Emergency Fire Pump (E001)	NA	NA	7.87E-4	NA	9.92E-4	NA
Anaerobic Treatment Basin (A100)	4.83	NA	NA	NA	NA	NA

[a] Pounds per hour
[b] Non-carcinogen, emission rate used for modeling the maximum 24-hour average
[c] Carcinogen, emission rate used for modeling the maximum annual average
[d] Emissions rate per each unit

Table 6 lists the emission release parameters used in the dispersion modeling analyses and Figure 2 shows building and emission point locations. All emissions are released to the atmosphere through stacks except for the Anaerobic Treatment Basin. This source was modeled as a 210-foot by 361-foot ground-level area source. Emissions from the Batter Room Dust Collector and the Emergency Fire Pump vent horizontally through a wall vent. The stack diameter and stack gas flow velocity associated with these sources were modeled with values of 0.001 meters and 0.001 meters per second, respectively, to prevent improper consideration of stack tip downwash and momentum plume rise.

Table 6. Emission and Stack Parameters

Source / Location	Source Type	Stack Height (m)[a]	Stack Dia. (m)	Stack Gas Temp. (K)[b]	Stack Gas Flow Velocity (m/sec)[c]
Perfy Fryer Air Washer (F108)	Point	16.0	0.95	311	7.20
Tot Fryer Air Washer (F103)	Point	16.35	1.13	328	8.13
Prime 1 Fryer Air Washer (F104)	Point	18.0	0.95	353	8.91
Prime 2 Fryer Air Washer (F204)	Point	13.6	0.97	342	13.38
Tot Dryer (D107)	Point	16.0	0.91	321	13.92
Prime 1 Dryer – Stack East (D105)	Point	18.5	1.03	375	9.27
Prime 1 Dryer – Stack West (D106)	Point	18.5	1.03	344	8.19
Prime 2 Dryer – Stack #1 (D205)	Point	12.0	1.46	318	11.38
Prime 2 Dryer – Stack #2 (D206)	Point	12.0	1.46	314	12.16
Prime 2 Dryer – Stack #3 (D207)	Point	12.0	1.46	319	10.12
Prime 2 Dryer – Stack #4 (D208)	Point	12.0	1.46	309	11.34
Murray 1 Boiler (B101)	Point	12.41	1.52	426	7.73
Murray 2 Boiler (B203)	Point	11.56	0.91	426	8.39
Nebraska 1 Boiler (B102)	Point	19.79	1.22	426	11.54
Nebraska 2 Boiler (B202)	Point	20.38	0.91	426	16.76
Batter Room Dust Collector (E209)	Point	2.64	0.001	0	0.001
Emergency Fire Pump (E001)	Point	1.85	0.001	502.59	0.001
Anaerobic Treatment Basin (A100)	Area	NA	NA	NA	NA

[a] Meters
[b] Kelvin
[c] Meters per second

Lead (Pb) was not included in the dispersion modeling analyses. Potential Facility-wide Pb emissions were estimated at 3.31 E-4 tons per year (TPY). This emission level is over three orders of magnitude less than the significant emission level (IDAPA 58.01.01.006. 92) and two orders of magnitude less than the value defined as "below regulatory concern" for permit to construct (PTC) applicability (IDAPA 58.01.01.221.01). Therefore, it was concluded that Pb emissions from the facility could not reasonably be expected to cause or significantly contribute to a violation of the Pb NAAQS.

A significant impact analysis was initially performed to determine if emissions resulting from operation of the facility would "significantly contribute" to pollutant concentrations in ambient air. A full impact analysis was then performed for those pollutants emitted from the facility that were estimated to have an ambient impact exceeding "Significant Contribution" levels. The full impact analysis involved adding the dispersion modeling results to background concentrations.

3. MODELING RESULTS:

Modeled ambient air impact results from the significant impact analysis are provided in Table 7. Because the impact from facility emissions exceeded significant contribution levels for annual NO_2, annual PM_{10}, 24-hour PM_{10}, 24-hour SO_2, 3-hour SO_2, and 1-hour CO, a full impact analysis was performed for those pollutants and averaging times.

Nitrogen dioxide concentrations were conservatively estimated by assuming 100% of NOx is NO_2. Results of the full impact analysis are presented in Table 8, and indicate that operation ofthe facility as described in the Tier II OP application will not cause or significantly contribute to a violation of a NAAQS. Modeled PM_{10} impacts of 144 $\mu g/m^3$ (including background) are approaching the 24-hour NAAQS of150 $\mu g/m^3$. However, this concentration level is confined to a relatively small area along the facility's northern boundary, as shown in Figure 3. The predominant north/south concentration contours may be a result of using surface meteorological data from Pocatello. The presence of the Snake River near the site would be expected to cause concentration contours with a more predominant east/west component.

Table 7. Significant Impact Analysis for Criteria Pollutants.

Pollutant	Averaging Period	Ambient Concentration ($\mu g/m^3$)[a]	Significant Contribution[b] ($\mu g/m^3$)	Full Impact Analysis Required (Y or N)
Nitrogen dioxide (NO_2)	Annual	12.4[d]	1.0	Y
Sulfur dioxide (SO_2)	3-hour	187[e]	25	Y
	24-hour	29[e]	5	Y
	Annual	0.32[d]	1.0	N
Carbon monoxide (CO)	1-hour	2,575[e]	2,000	Y
	8-hour	323[e]	500	N
PM_{10}[c]	24-hour	44[f]	5.0	Y
	Annual	10.4[d]	1.0	Y

[a] Micrograms per cubic meter
[b] Significant Contribution level as per IDAPA 58.01.01.006.93.
[c] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
[d] First highest modeled value
[e] Second highest modeled value
[f] Sixth highest modeled value

Table 8. Full Impact Analysis for Criteria Pollutants.

Pollutant	Averaging Period	Ambient Concentration ($\mu g/m^3$)[a]	Background Concentration ($\mu g/m^3$)	Total Ambient Concentration ($\mu g/m^3$)	Regulatory Limit[b] ($\mu g/m^3$)	Compliant (Y or N)
Nitrogen dioxide (NO_2)	Annual	12.4[d]	40.0	52	100	Y
Sulfur dioxide (SO_2)	3-hour	187[e]	374	561	1,300	Y
	24-hour	29[e]	120	149	365	Y

Table 8. Full Impact Analysis for Criteria Pollutants.

Pollutant	Averaging Period	Ambient Concentration ($\mu g/m^3$)[a]	Background Concentration ($\mu g/m^3$)	Total Ambient Concentration ($\mu g/m^3$)	Regulatory Limit[b] ($\mu g/m^3$)	Compliant (Y or N)
Carbon monoxide (CO)	1-hour	2,575[d]	11,450	14,025	40,000	Y
PM_{10}[c]	24-hour	44[f]	100	144	150	Y
	Annual	10.4[e]	25.1	35.5	50	Y

[a] Micrograms per cubic meter
[b] IDAPA 58.01.01.577
[c] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
[d] First highest modeled value
[e] Second highest modeled value
[f] Sixth highest modeled value

Potential emissions of non-carcinogenic TAPs were all below screening emission levels, except for hydrogen sulfide (H_2S). Hydrogen sulfide is only emitted from the Anaerobic Treatment Basin. Emissions of H_2S were modeled to predict the maximum 24-hour averaged concentration. Modeled concentrations exceeded the AAC in one area north of the facility along the property boundary. The model was rerun after adjusting artificially low mixing heights to a height of 30 meters, and resulting concentrations still exceeded the AAC. Figure 4 shows maximum modeled H_2S concentration contours for the 24-hour averaging period. Review of the meteorological data associated with dates exhibiting high H_2S concentrations indicated that the high concentrations were a result of very low wind speeds and the close proximity of the emission source to the property boundary. During low winds, the ground level emissions do not significantly disperse before impacting a ground level receptor along the property boundary.

DEQ determined that the modeled 24-hour H_2S impact was acceptable because of the following:

1) The area where model results predict an exceedance of the AAC is located between the facility property boundary and the Snake River. Although this area is considered ambient air, there is a very low probability that members of the public could be present during periods when concentrations may exceed the AAC. Furthermore, it is unlikely that any member of the public present at that location and time would remain for a 24-hour period, and thereby be exposed to a 24-hour averaged concentration that exceeds the AAC.
2) The maximum modeled concentration was 862 $\mu g/m^3$, compared to an AAC of 700 $\mu g/m^3$. This concentration is still well below all occupational exposure limits.
3) Over a modeled period of five years, concentrations potentially exceeding the AAC were predicted to occur during only five days (0.3% of the time).

Potential odor concerns were also evaluated by using the maximum measured H_2S emission rate along with hourly averaging periods. Figures 5 and 6 show maximum 1-hour modeled concentrations. Concentrations may exceed the 11 $\mu g/m^3$ odor threshold at distances of several kilometers from the property boundary. For comparative purposes, maximum hourly concentrations were well below the NIOSH 10-minute ceiling value of 15,000 $\mu g/m^3$.

Screening Emission Levels for carcinogenic TAPs were exceeded for arsenic (As), benzene (C_6H_6), cadmium (Cd), formaldehyde (CH_2O), and nickel (Ni). Emissions of these pollutants were then modeled to predict the maximum annual averaged impact and the individual cancer risk associated with exposure to the maximum annual averaged concentration. Table 9 summarizes the carcinogenic TAP analysis. DEQ determined that impacts were acceptable because the maximum total individual cancer risk, associated with exposure to maximum concentrations of all carcinogenic TAPs with emissions exceeding the Screening Emission Levels, was below 1.0 E-5 (1 in 100,000).

Table 9. Carcinogenic TAP Modeling Analysis

Carcinogenic TAP	Maximum Modeled Annual Conc. ($\mu g/m^3$)	Unit Risk Factor (cancer risk /$\mu g/m^3$ - person)	Estimated Risk (cancer risk / person)
Arsenic (As)	2 E-5	4.3 E-3	8.6 E-8
Benzene (C_6H_6)	6.2 E-4	8.3 E-6	5.1 E-9
Cadmium (Cd)	1.1 E-4	1.8 E-3	1.98 E-7
Formaldehyde (CH_2O)	7.2 E-3	1.3 E-5	9.4 E-8
Nickel (Ni)	2.0 E-4	2.4 E-4	4.8 E-8
		Total Risk	4.3 E-7

The TAPs assessment performed for operations at McCain Foods demonstrated compliance with IDAPA 58.01.01.161 to the satisfaction of DEQ.

Electronic copies of the modeling analysis are saved on disk. Table 10 provides a summary of the files used in the modeling analysis. Stephen Coe has reviewed this modeling memo to ensure consistency with the permit and technical memorandum.

Table 10. Dispersion Modeling Files

Type of File	Description	File Name
Met Data	1987-1991 consistent with DEQ data	ModBoiPoc87.txt; ModBoiPoc88.txt; ModBoiPoc89.txt; ModBoiPoc90.txt; ModBoiPoc91.txt;
BEEST Input Files	PM_{10} 24-hour	PM24hr.BST
	SO_2 24-hour and 3-hour	SO224hr.BST
	CO 8-hour and 1-hour	CO24hr.BST
	NO_x annual for each of 5 years	NOxYY.BST (YY = year 87 – 91)
	PM_{10} annual for each of 5 years	PMYY.BST (YY = year 87 – 91)
	SO_2 annual for each of 5 years	SO2YY.BST (YY = year 87 – 91)
	H_2S 24-hour	H2S.BST
	H_2S using max emission 1-hour and 24-hour	H2SMax.BST
	Arsenic period average	As.BST
	Benzene period average	benzene.BST
	Cadmium period average	cadmium.BST
	Formaldehyde period average	formaldehyde.BST
	Nickel	nickel.BST
Each BST file has the following type of files associated with it:		
	Input file for BPIP program	.PIP
	BPIP output file	.TAB
	Concise BPIP output file	.SUM
	BEE-Line file containing direction specific building dimensions	.SO
	ISCST3 input file	.DTA
	ISCST3 output list file	.LST
	User summary output file	.USF
	Master graphics output file	.GRF
Some modeling files have the following type of graphics files associated with them		
	Surfer data file	.DAT
	Surfer boundary file	.BLN
	Surfer post file containing source locations	.TXT
	Surfer plot file	.SRF
Additional files		
Maps	McCain3.TIF; McCain4.TIF	Background USGS maps

KS:bm G:\AHW\SCHILLING\MCCAIN FOODS\MODELING TECH MEMO .DOC

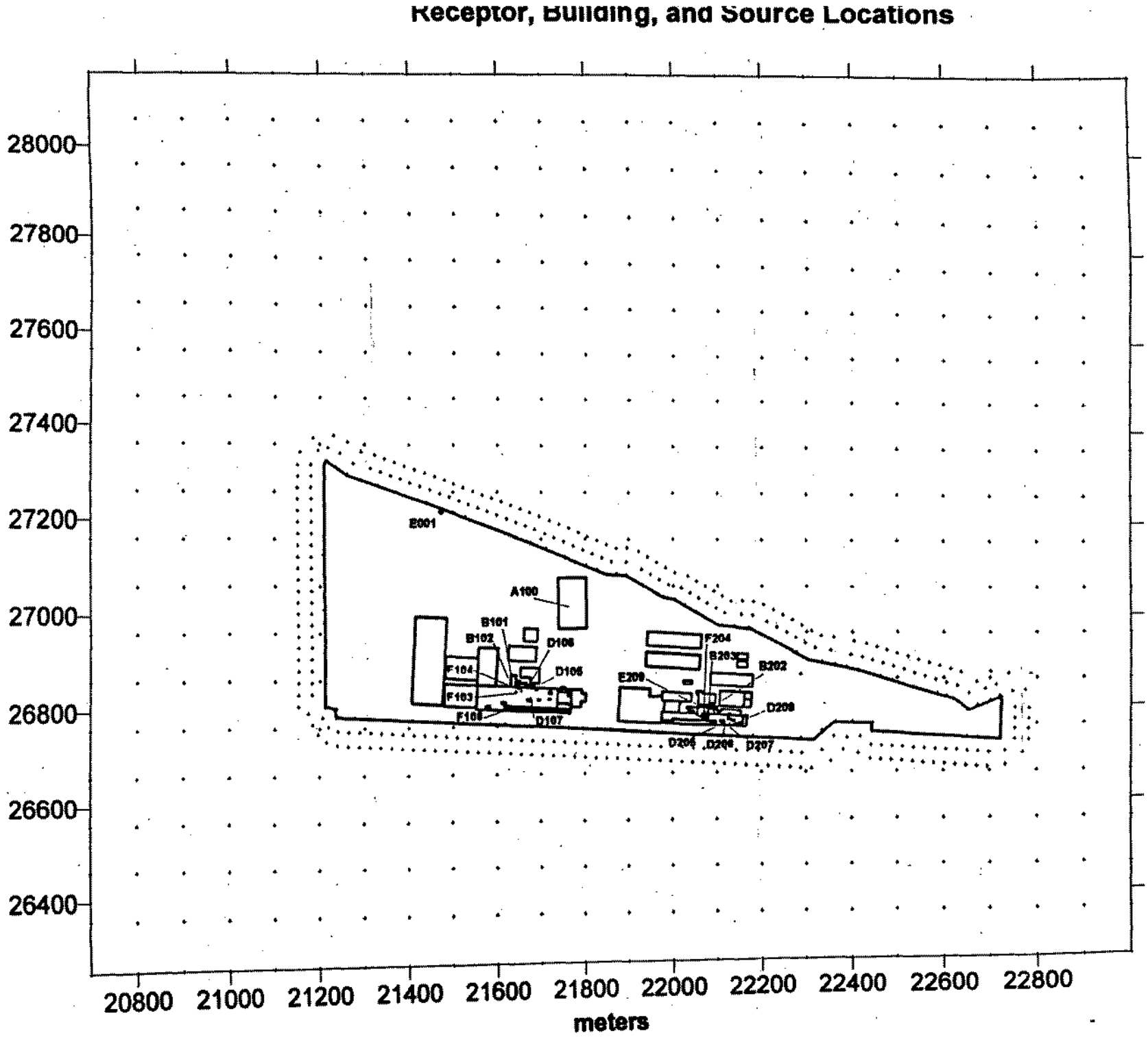
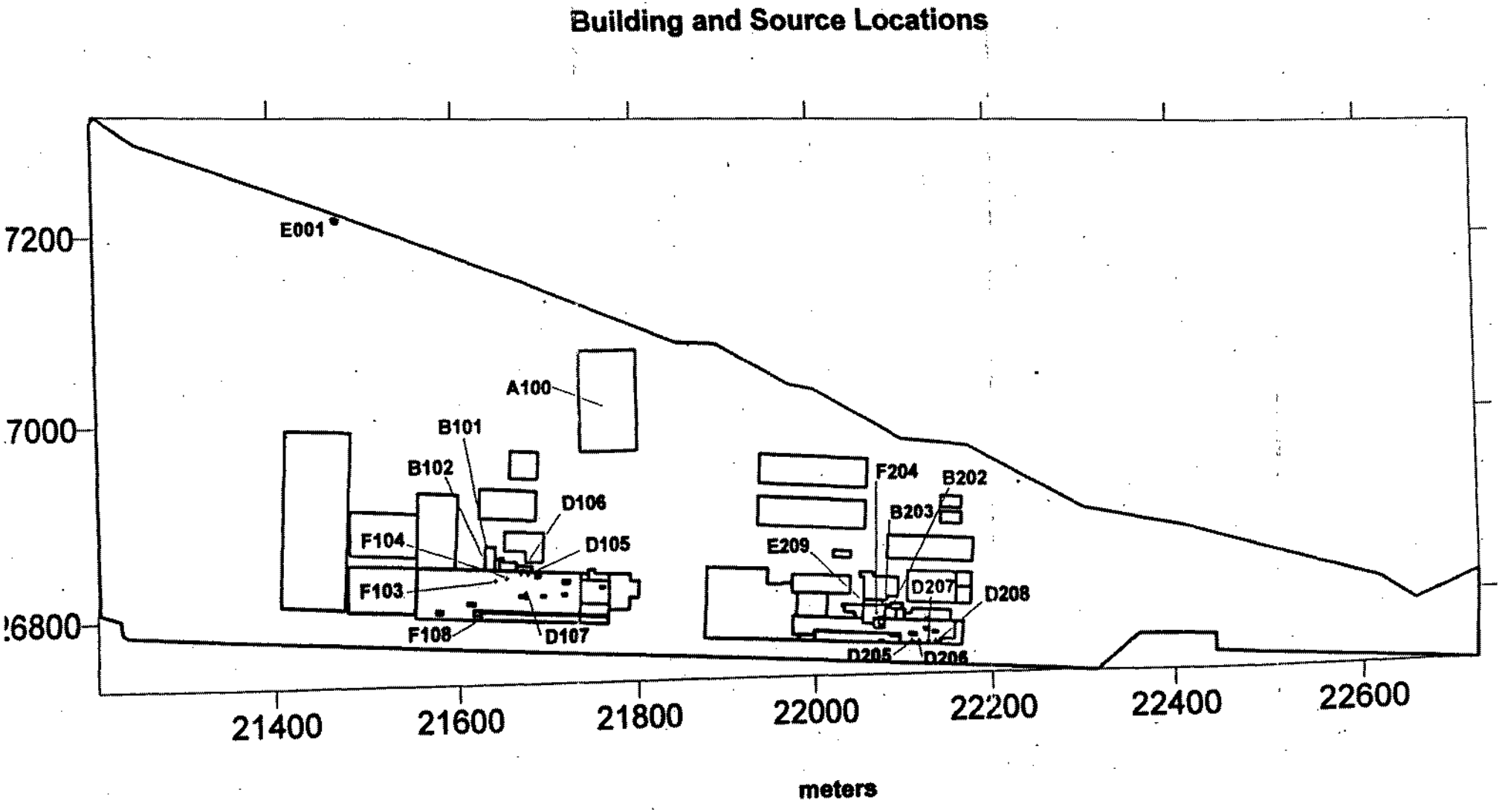
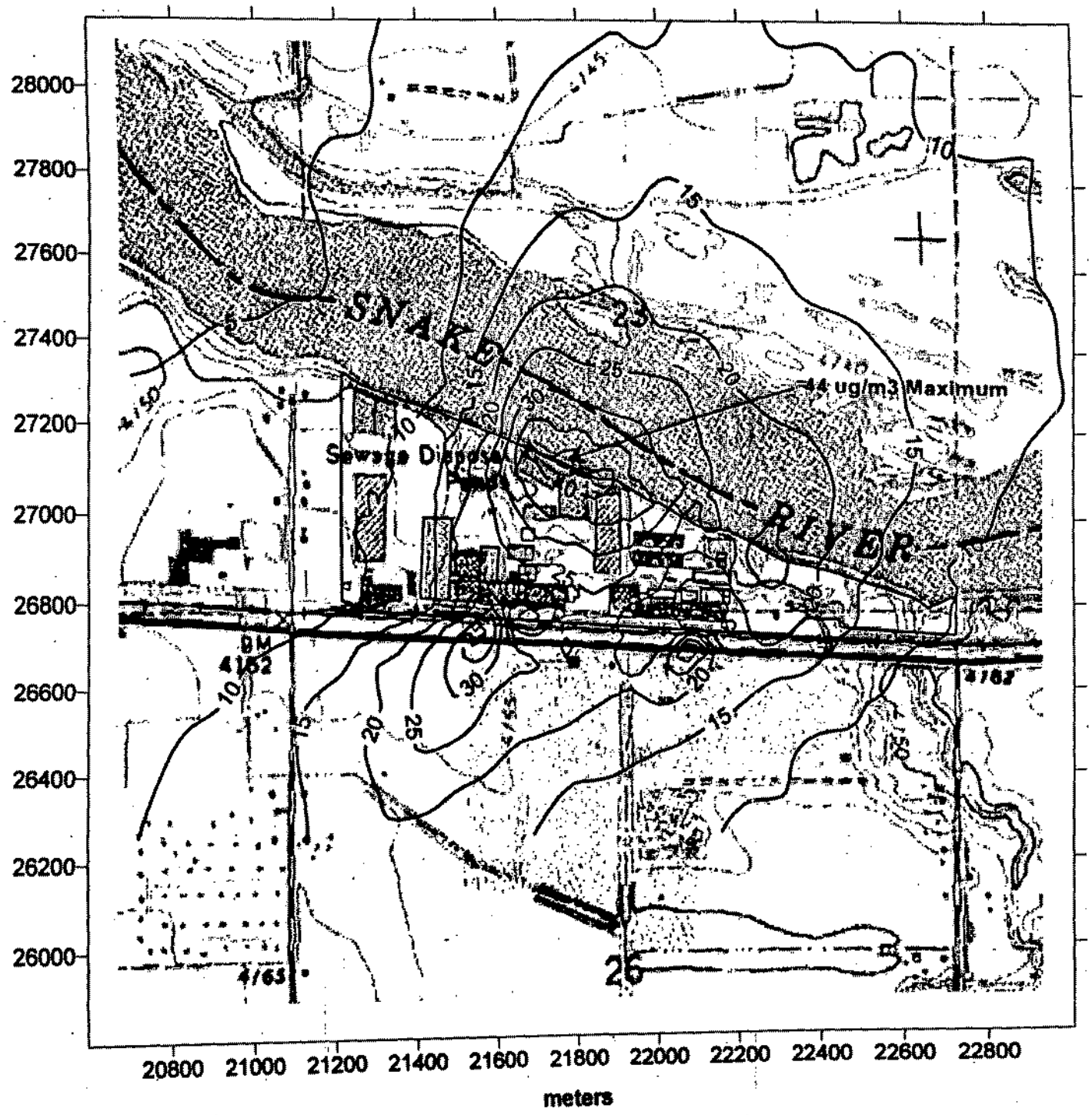

Receptor, Building, and Source Locations
28000
27800
27600
27400
27200
27000
26800
26600
26400
20800
21000
21200
21400
21600
21800
22000
22200
22400
22600
22800
meters
E001
A100
B101
B102
D106
F104
D105
F103
F105
D107
F204
B203
B202
E200
D208
D204
D206
D207

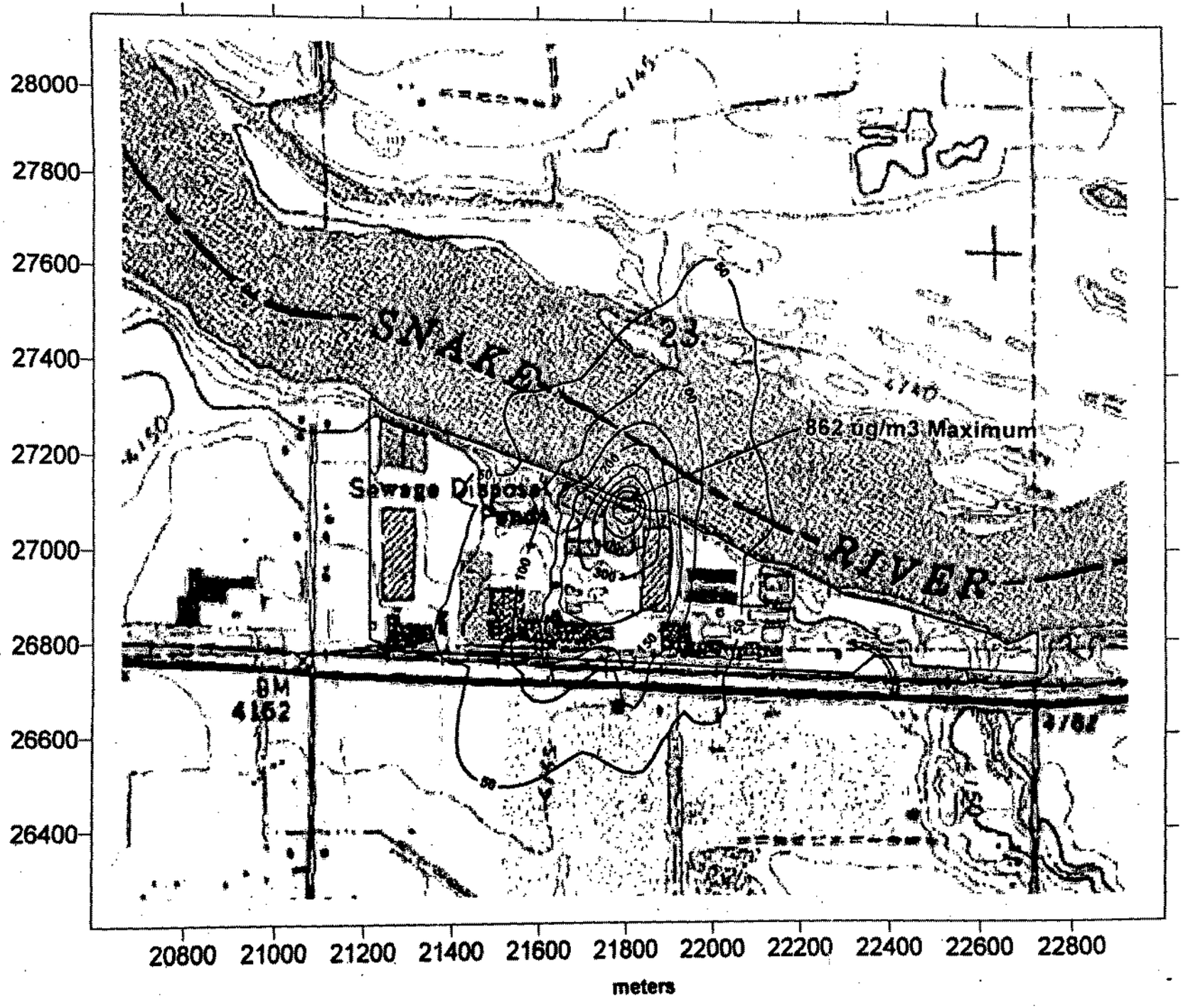
Figure 2 - McCain Foods Tier II Ambient Air Assessment



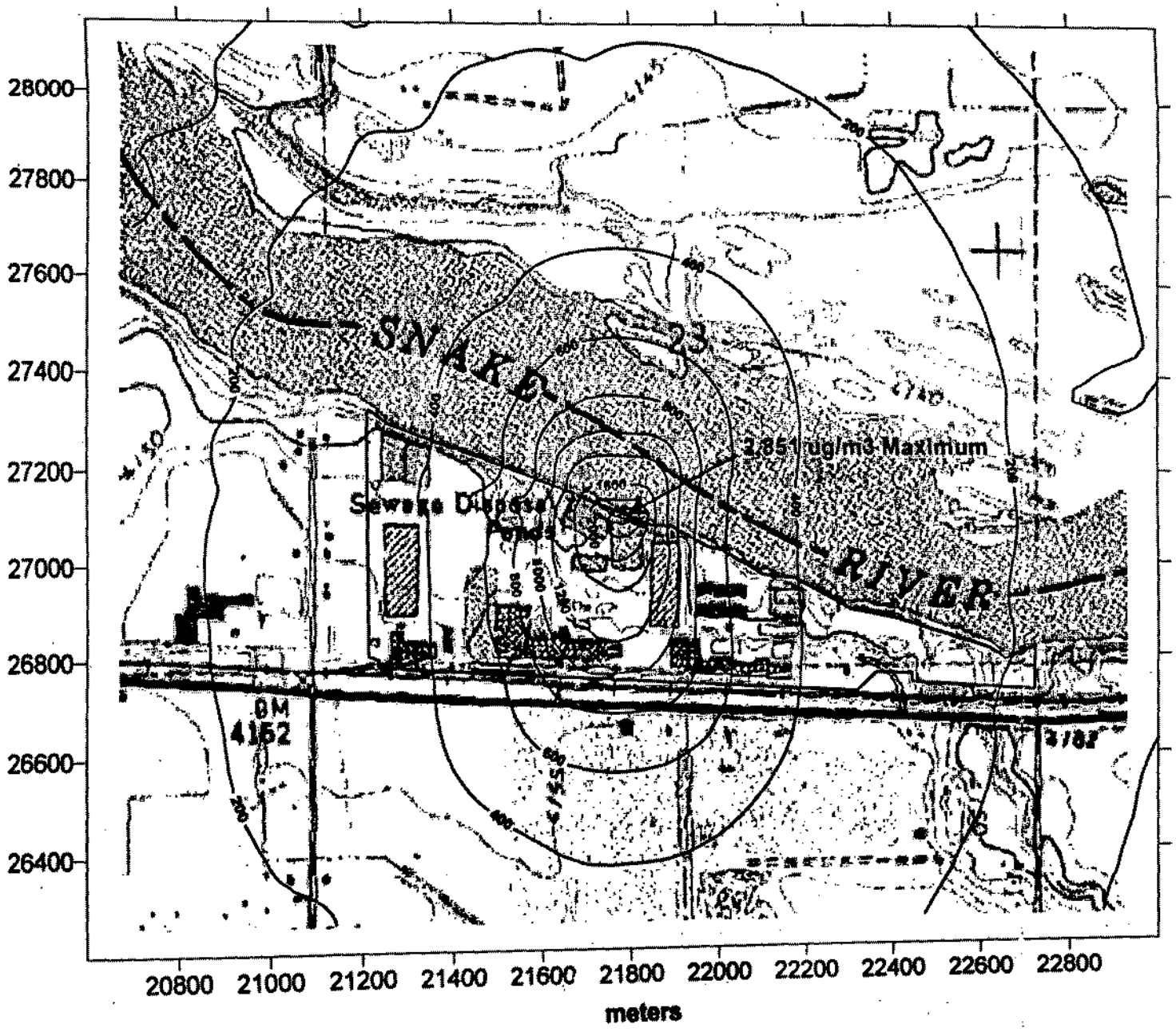
PM-10 Maximum 24-Hour Impact



H2S Maximum 24-Hour Impact



H2S Maximum 1-Hour Impact



Note: 11 ug/m3 odor threshold

ERPG(1) =140 ug/m3

ERPG(2) = 42,000 ug/m3